COMPUTERWORLD

THE NEWSWEEKLY FOR THE COMPUTER COMMUNITY

Weekly Newspaper

Second-class postage paid at Boston, Mass., and additional mailing offices

Price: $9/year | September 12, 1973 | Vol. VII, No. 37

NEWSPAPER

NEWS IN BRIEF

Telex/IBM Judgment Set for Sept. 17

TULSA, Okla. – Judge A. Sherman Christensen will deliver his opinion in the Telex-IBM antitrust case to the Federal District Court here next Monday, his office said last week.

And so will end the first antitrust case against IBM in recent times to go the distance, with more than 29 days of testimony and two days of closing arguments since the case opened on April 18 of this year.

The decision, which is expected to be lengthy, was pondered by Christensen for almost two months from the date of final argument in July, even though he had hoped to make the final decision earlier.

The delay in the decision apparently stems from the mountains of evidence submitted by each side in the case plus the lengthy transcripts and the complexity of the case.

NCC Promises 100 Sessions, Emphasis on Users' Needs

MONTVALE, N.J. – An expanded conference program at the 1974 National Computer Conference & Exposition, May 6-10, at McCormick Place, Chicago, will include more than 100 sessions covering a wide range of technologies and applications with strong emphasis on computer productivity relating to the user. This will include the computer professional, the worker in applications, computer managers and user managers and corporate executives, according to the American Federation of Information Processing Societies, NCC sponsor.

Theodore M. Bellan, conference program chairman, said the program will provide a forum "where outstanding representatives of industry can demonstrate how the computer and its technology are employed to contribute to more efficient operations of their organizations. It is our intent to develop the program so that presentations in one area of applications will be of interest and benefit to another area."

On the Inside This Week

United Shoe Case Significant In IBM/Justice Antitrust Case *—Page 9*

Commerce Forecasts German DP Growth *—Page 35*

Communications 17
Computer Industry 35
Editorial 10
Education 30
Financial 46
Societies 26
Software/Services 15
Systems/Peripherals 21

Bell Can't Prove Network Harm

By Ronald A. Frank
Of the CW Staff

WASHINGTON, D.C. – AT&T has admitted that detailed information concerning specific types of harm allegedly being caused by the interconnection of customer-provided equipment "is not currently available to a greater extent than was supplied" earlier.

The Bell response was made to the Federal Communications Commission following a commission staff request for further details about the connection of non-carrier equipment to the telephone network.

In May, AT&T told the FCC that 30% of the customer-provided equipment connected to the phone network was actually causing harm. The AT&T submission listed the results of a two-month period during which Bell said it was shown customer-provided equipment has a higher trouble rate than carrier-provided equipment [CW, May 16].

After studying the AT&T charges, the FCC staff countered in June with a requirement that Bell provide additional information because "key statistical parameters" had not been provided to support AT&T's claims [CW, June 20].

In the latest round of correspondence, AT&T maintains it is unable to provide a trouble breakdown because its "study did not provide this degree of detail."

The Bell statement did include an explanation of what it defines as "unnecessary dispatches" of its repair craftsmen, at the request of the commission.

An unnecessary trouble call is one "in which telephone company personnel are required to expend efforts to determine that customer-provided equipment is causing a trouble condition," AT&T said. This type of call is "clearly contrasted" with calls to users who have equipment supplied by a local carrier, Bell said.

"There is no such thing as an 'unnecessary' trouble call for telephone company-owned equipment," AT&T told the commission.

The latest AT&T submission said all data used for its claims concerning the adverse effects of customer-provided equipment was based on the Maintenance of Service Charge form.

To get more comprehensive data, Bell said, the format of this report would have to be modified and new Bell System Practices would have to be issued along with letters of instructions to Bell repairmen and others.

Too Expensive

The additional expense of such a change on both the local and national level "would be very substantial," Bell said.

It is believed that the FCC staff is concerned that Bell has been unable to substantiate its continuing charges of harm to telephone facilities by customer-provided equipment.

Industry observers point out the issue of harm or possible harm to telephone facilities forms the foundation of Bell's claim that protective devices such as the Data Access Arrangement are needed. They reason that without conclusive proof that customer-provided equipment has actually caused harm, the Bell position is considerably weakened.

The FCC staff is currently considering a response to the latest AT&T answer. Some staff members are apparently becoming skeptical that continued correspondence on the matter will provide any additional relevant data.

While Fire Raged Upstairs

Programs Saved, CPU Sunk

By Patrick Ward
Of the CW Staff

OVERLAND, Mo. – The first steps to protect a DP installation at the U.S. Military Personnel Records Center from fire last July were taken even as the flames were raging.

The data center chief of the first-floor Federal Data Processing Center rushed in and covered the CPU with a plastic sheet, plucked the disks from a five-spindle 2314 disk drive and grabbed the master program files.

Unfortunately, there was a hole in the plastic sheet covering the CPU and water pouring down through the building drained directly onto the IBM 360/30 and into memory.

The fire that occurred the night of July 11 threatened the personnel records of 26 million past and present members of the U.S. military.

The blaze in the giant records center was concentrated on the top floor of the six-story building, so the firefighters' water seeped down to the DP center's first floor location.

A Biology Lab?

When the DP staff returned, it found five inches of water under the raised floor, the false ceiling saturated, humidity tremendously high and some sort of crystals forming on equipment cabinets.

"We weren't sure," said James Keena, director of federal DP for the region, "but what we did was to assume there was some sort of acid or salt residue from the smoke in the water. We had to get at the circuitry rather quickly, because such residues would have caused damage, and we got estimates [on the threat] quickly."

Keena contacted the Naval Research Lab in Washington, D.C., which had had experience with a computer room fire at the Goddard Space Center, and asked for advice on how to prevent accumulation of crystal residue on the circuitry. The staff there recommended taking a sample of any humidity that was still collecting in the computer center, and then doing a quick and thorough cleaning of the equipment if warranted.

"We could actually see some deposits building up on the false floor," Keena said, "so we believed there might be something growing inside the unit itself. "Humidity was building up even though water did not actually get into most of the circuitry," he added.

The first thing the DP staff did was to drain out all of the water on the cables.

"Of course, the power was gone and the air conditioner and humidity control was gone, and so we used squeegees and everything we could to try to get the water that was trapped around the cables," Keena said.

(The cables are being replaced, "probably our single biggest expense," Keena said. Both IBM and the Naval Research Lab felt the cables would be too prone to degradation.)

Next the false ceiling was ripped out because it was sagging and dripping.

As soon as possible, the air conditioners and space heaters were turned on. The CPU was opened up to expose it while the combination of heaters and air conditioners extracted moisture from the air.

The General Services Administration,

(Continued on Page 2)

ACM Adopts Strong Ethics Code, But Nixes Enforcement Procedures

By a CW Staff Writer

ATLANTA – The ACM Council has officially adopted a strong code of professional ethics for members of the data processing community, but has shied away from writing any strong enforcement procedures into its bylaws.

The council agreed to adopt the code, without the enforcement provisions, by a vote of 15 to 4 with three abstentions, at its recent meeting here following the ACM '73 Conference.

Previously, the ACM membership had amended the ACM constitution to call for a code of ethics and enforcement procedures by a vote of 4 to 1 of the membership at large.

Five Planks

The new code has five major planks, the first calling for all ACM members to "act at all times with integrity"; the second calling on members to strive to increase their own competence and the competence of the profession at large; the third declaring that professionals should "accept responsibility" for their work; the fourth calling on members to act with professional responsibility; and the final canon declaring that members should use their specialized knowledge to "the advancement of human welfare."

Under the first plank, ACM members are barred from intentionally misrepresenting themselves or any aspects of the capabilities of information systems of which they are aware. In addition, it calls on professionals to make their clients aware of any facts they know about information systems that their clients should be aware of.

It also prohibits ACM members from using any confidential information gained at a job without the specific permission of that employer.

In the area of improving professional competence, ACM members are encouraged to continue their own education and to encourage others to do the same. This canon also calls on members to oppose any false stories about information proc-

(Continued on Page 2)

Congressmen May Be Violating Rules With Computer System

By E. Drake Lundell Jr.
CW Washington Bureau

WASHINGTON, D.C. – Some congressmen may be voting illegally through the House of Representatives computerized voting systems, but the problem is probably not one of technology but ethics.

According to reports here, some congressmen may be giving friends their plastic cards that are inserted into the voting stations on the House floor and allowing those other congressmen to cast their votes for them.

While admitting this was possible, Dr. Frank Ryan, the computer expert with the House's Committee on House Administration, said this "is not a problem associated with computer systems, but has to do with the ethics of congressmen.

"I don't personally believe it has happened," he added.

With the automatic vote-counting system a congressman goes to one of the terminals on the floor of the House and inserts a card coded with his personal identifier Then he presses either a yes or no button and his vote on that issue is recorded in the computer system.

According to reports here – most notably a recent column by syndicated columnist Jack Anderson – some congressmen who have to be away from the House floor when a vote is being taken have given their cards to friends with instructions on how to vote on certain issues.

This would violate house rules, because only members who are present can vote on measures before the House.

Anderson noted, however, that the percentage of members present during the recently ended session of Congress has been higher than in the past, possibly because many members were letting friends vote for them.

Anderson said it would be very easy for one congressman to slip an extra card into the system after casting his own vote in order to vote for someone who was absent.

COMPUTERWORLD
THE NEWSWEEKLY FOR THE COMPUTER COMMUNITY
TM Reg. U.S. Pat. Off.

DR. H.R.J. GROSCH, *editorial director*

EDWARD J. BRIDE, *editor*

V.J. FARMER, *managing editor.* **RONALD A. FRANK,** *technical news editor.* **E. DRAKE LUNDELL JR.,** *computer industry editor.* **MARVIN ARONSON,** *assistant managing editor.* **DONALD LEAVITT,** *software editor.* **MICHAEL WEINSTEIN,** *systems editor.* **MARY UPTON,** *financial editor* and *assistant computer industry editor.* **LESLIE FLANAGAN, JUDITH KRAMER,** *copy editors.* **PATRICK G. WARD, TONI WISEMAN, MARGUERITE Y. ZIENTARA,** *staff writers.*

E. DRAKE LUNDELL JR., *Washington bureau.* **MARVIN SMALHEISER,** *West Coast bureau.* **J.H. BONNETT,** *European bureau.* **HIDETSUNA SASAKI,** *Asian bureau.*

CONTRIBUTORS: **J. DANIEL COUGER,** *education column;* **FRANK GREENWOOD,** *management column;* **ALAN TAYLOR,** *Taylor Report* and *professional practices.*

NEAL WILDER, *vice president – marketing.* **DOROTHY TRAVIS,** *marketing administrator.* **JUDY MILFORD,** *advertising coordinator.* **KATHRYN V. DINNEEN,** *market research.*

LEETE DOTY, *production manager.* **HENRY FLING,** *production supervisor.*

W. WALTER BOYD, *publication manager.* **PATRICK J. McGOVERN,** *publisher.*

EDITORIAL OFFICES: 797 Washington St., Newton, Mass. 02160. Phone: (617) 332-5606. Telex: 92-2529. **Washington:** Room 1129, National Press Bldg., Washington, D.C. 20004. Phone: (202) 638-0901. Telex: 89-544. **Los Angeles:** 963 N. Edgecliffe Drive, Los Angeles, Calif. 90026. Phone: (213) 665-6008. **Europe:** Computerworld, c/o IDC Europa Ltd., 59 Grays Inn Rd., London, W.C.1, England. Phone: 01-242-8908. **Asia:** Computerworld, c/o Shukan Computer, Dempa Building, 1-11-15, Higashi Gotanda, Shinagawa-ku, Tokyo 141. Phone: (03) 445-6101. Telex: 26792.

Second-class postage paid at Boston, Mass., and additional mailing offices. Published weekly (except: a single combined issue for the last week in December and the first week in January) by Computerworld, Inc., 797 Washington St., Newton, Mass. 02160. ©1973 by Computerworld, Inc.

25 cents a copy; $9 a year in the U.S.; $10 a year in Canada; all other foreign, $25 a year. **MARGARET PHELAN,** *circulation manager.* Four weeks' notice required for change of address. Address all subscription correspondence to circulation manager, Computerworld, 797 Washington St., Newton, Mass. 02160

Reproduction of material appearing in *Computerworld* is strictly forbidden without written permission. Send all requests to publication manager.

Computerworld can be purchased on 35mm microfilm in half-volumes (six-month periods) through University Microfilm, Periodical Entry Dept., 300 Zeeb Rd., Ann Arbor, Mich. 48106. Phone: (313) 761-4700. w

COMPUTERWORLD, INC.

Patrick J. McGovern .... *president*
W. Walter Boyd ...... *executive vice president*
Robert M. Patterson ...... *vice president–int'l.*
T. Neal Wilder ...... *vice president–marketing*

BPA ABP AIA

POSTMASTER: Send Form 3579 (Change of Address) to Computerworld Circulation Dept., 797 Washington St., Newton, Mass. 02160.

Psst... Want to Get Into Print?

BOSTON – Writing articles for *Computerworld*, or any other technically oriented publication, may be easier than you think.

If you've got the information, you can communicate it . . . if you understand the ins and outs of getting into print. A one-day seminar here on Oct. 19 is your opportunity to find out how to make editors want to publish your articles, to discover what editors want and how they can assist you.

At the "How to Write for Publication" seminar, sponsored by the Science Communication Division of the Boston University School of Public Communication, you can meet CW's managing editor, V.J. Farmer, and 13 other editors of national, Boston-based, technical publications.

Seminar leaders will explain what editors look for and how articles for feature, featurette and news sections are selected.

You will have the opportunity to lunch with one editor and dine with another, both of your choice. In addition, you can consult privately after dinner with any editor concerning your specific projects.

Subjects to be discussed include:

- How to pick appropriate publications.
- How to deal with the editors of these publications.
- How to start a book with a series of published articles.
- How to become an occasional columnist or guest editorialist.
- How to get different versions of your articles in two or more publications as "in-field exclusives."

Also present at the meeting will be editors from *Circuits Manufacturing, Computer Design, Data and Communications Design, Design News, Digital Design, Electrical Design News, Electromechanical Design, Laser Focus, Microwave Journal, Modern Data, Plastics World, Systems Designer's Handbook* and *Telecommunications.*

The seminar will be held at Boston University's George Sherman Union. The registration fee of $75 includes lunch, dinner, cocktails and all materials.

Checks should be made payable to Boston University-SPC and sent to Mrs. Shirley Coyne, Boston University School of Public Communication, 640 Commonwealth Ave., 02215.

Program Tapes Saved As Fire Raged Upstairs

(Continued from Page 1)

which manages the Federal Data Processing Center, hired Sorbus, Inc. to renovate, inspect and repair the center and then provide maintenance, if needed, for a year.

Sorbus "inspected every unit, cleaned it, did some painting where required and replaced parts that were obviously damaged by water and corrosion," Harold Pingel, Sorbus district manager, said.

Federal Data Processing uses 2314s, four tape drives, a 2803 tape controller, a 1442 card reader, a 1403 printer and a 2821 control unit.

The fans of these units had to be replaced because of the moisture that collected in their bearings, but the 64K CPU suffered the most damage of any equipment.

The Sorbus men removed the unit's read-only memory and brought it to their refurbishing center which was only five blocks away. There, Pingel said, they disassembled it and cleaned it, replaced some parts and then put it back in the 360/30.

Trial operation began Aug. 15 and the system was back to work by Aug. 20.

The operation of the computer system was of vital interest to GSA, a spokesman said, in that it served as a directory to master personnel records in the military records center.

Getting Up

The Federal Data Processing Center staff members took the master programs and disks the data center chief had salvaged to the nearby Army Troop Command and had them running under modified DOS in a 360/50, albeit inefficiently, while repairmen were working at their own installation.

"That got us up and alive," Keena said.

"In retrospect, the programs and disks might have been alright," if they had been left in the data center, Keena allowed, but he considers their retrieval "an heroic act."

The contract with Sorbus was negotiated. GSA had also talked with IBM and ITT, according to a GSA spokesman, but neither of those firms was as responsive to GSA's desire for on-site repairs and a one-year maintenance period as Sorbus was, he continued. The fact that Sorbus had a nearby repair center was "a plus factor," he added.

The Sorbus contract was fixed at $6,900 plus parts for refurbishing, a power-on inspection and repairs; and $8,714 for the year-long maintenance period.

ACM Adopts a Code of Ethics

(Continued from Page 1)

essing or computer capabilities.

In the area of responsibility, members are admonished to say they cannot do a job when they know or should know such a job is beyond their capabilities, and not undertake projects without a reasonable chance of success. They should also notify their employers or clients of the probable consequences of overruling the technical decisions.

Social Awareness

To advance human welfare, the code calls on ACMers to be aware of the social consequences of their systems and to try to build systems in areas such as health and other socially related fields.

This canon also has strict provisions for the right to privacy, calling on ACM members to try to limit the amount of personal data collected and the amount of data that can be accessed, and to include provisions in such systems for the proper disposal of such personal data.

The code, drawn by a committee headed by council member Roger Mills, is reportedly based to a large extent on the code of ethics adopted by the American Bar Association, as were the proposed enforcement procedures passed over by the council.

Comments Invited on CDP Code of Conduct

PARK RIDGE, Ill. – Comments are invited by the Certification Council of the Data Processing Management Association on its newly proposed codes of conduct and good practice for holders of the Certificate in Data Processing.

The codes in effect expand the code of ethics which was approved by the council in 1967, and have been formulated to strengthen the professional status of CDP holders, the council said.

It said further the codes should prove useful in defining specifically an individual's professional responsibility. They were adopted in recognition of questions on what constitutes professional and ethical conduct in data processing.

The code of conduct covers the areas of disclosure, social responsibility, statements of qualified opinion, identification when expressing an opinion outside of a holder's professional competence, integrity, conflict of interest, accountability and protection of privacy.

The code of good practice covers the areas of education, personal conduct, competence, statements regarding status of information technology or use of computers, discretion, conflict of interest and reporting of violations.

Copies of the codes may be obtained from John A. Guerrieri, Certification Council secretary, 505 Busse Hwy., Park Ridge, Ill. 60068.

Watergate Dampened Desire For Centralized Data File

ATLANTA – The Watergate scandal has dampened the already minimal enthusiasm for a central information computer, according to Murray Roman, chairman of Campaign Communications Institute of America, Inc.

Roman predicted that Watergate's rekindling of the privacy issue will postpone the establishment of a centralized computer bank of credit information on consumers indefinitely, and prompt "a quick return to zealous protection of individual rights to privacy throughout every facet of society."

As recently as a year ago, according to Roman, the credit industry was headed directly for a single computer system containing credit and personal data on every person holding a Social Security card in the U.S.

Need Computer? Try Rock

WATERVILLE, Me. – If you're desperate for funds to buy equipment for your computer center you might try a rock concert.

Sha-Ha-Ha, a student rock group from Messalonskee High School here, put on a benefit concert and raised some $560. The funds were used to help purchase a Monroe calculator for the math department.

"I've been trying to get some kind of computer into the system for the last four years," said Joseph Morin of the math department, "but every year the school board shot us down because of funds. So we took the matter into our own hands."

You never get rich just selling to relatives.

Even if all your relatives are named UNIVAC®.

So the Communications and Terminals Division of Sperry Univac provides total communications systems for everybody. No matter what name is on your mainframe.

We can offer the experience and the equipment to meet your toughest requirements. And we can offer the prices, performance and support to meet our toughest competition.

Beginning with the UNIVAC 3760 communications controller, your system builds. With the UNISCOPE® 100 display terminal, the DCT 500 keyboard-printer, the DCT 1000 remote-batch terminal, 610 tape cassette, card readers, paper tape equipment, etc.

The result is a complete, flexible data communications system compatible with your computer.

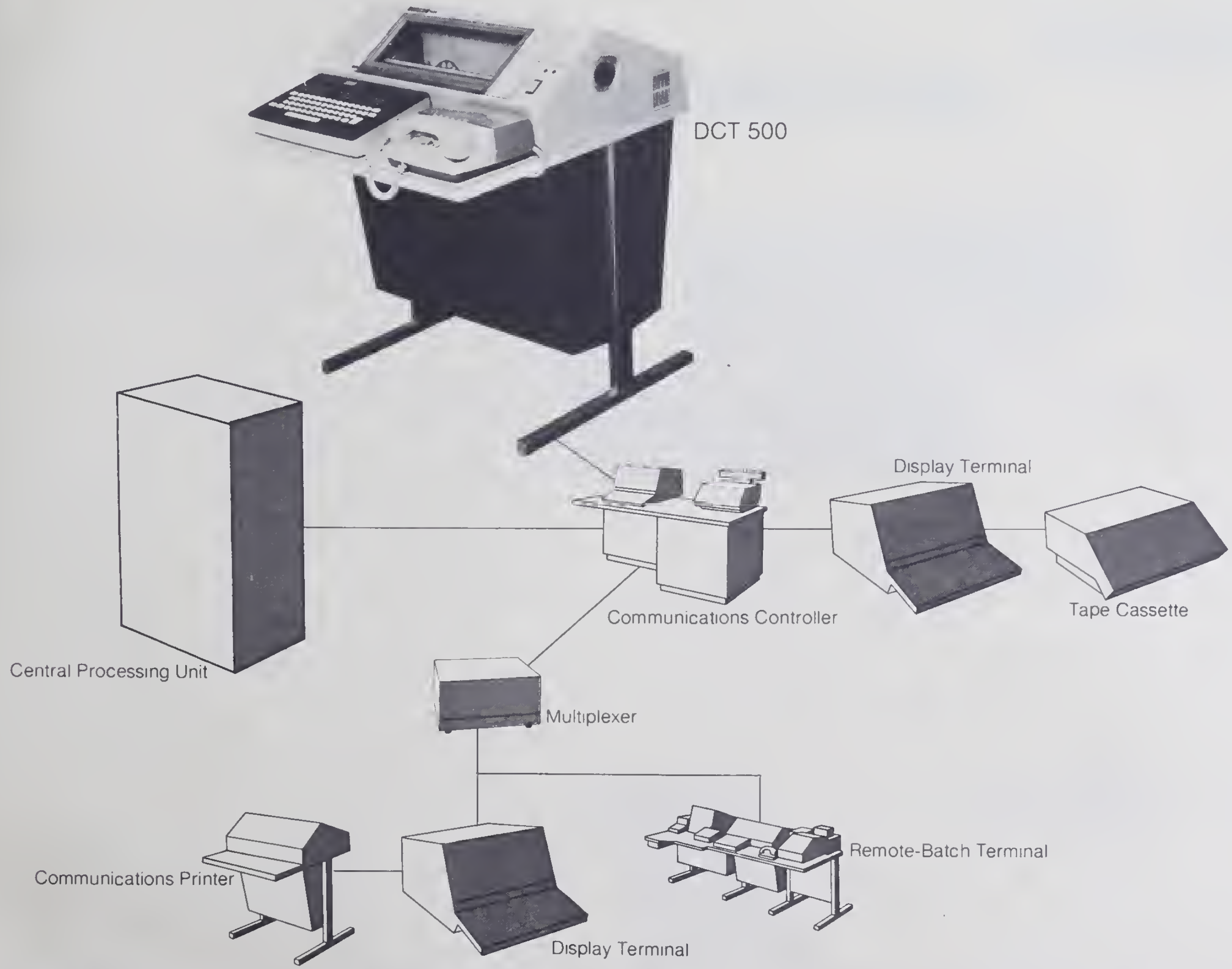
All with the assurance of high-performance equipment.

The UNIVAC DCT 500 data communications terminal, for example, has 30 cps, 132 print positions, computer-quality printout, up to 6-part use. It's one of the most wanted hard copy terminals in the industry.

As you'd expect, our systems are backed by an expert worldwide service organization.

For a brochure on our total systems capability, contact the Sperry Univac representative in your area.

Or call free 800-453-5323.



COMMUNICATIONS AND TERMINALS DIVISION

SPERRY UNIVAC

Only when our customers succeed do we succeed.

SPERRY UNIVAC IS A DIVISION OF SPERRY RAND CORPORATION

Records Not Protected by Law

Fear Political Uses

UK Doctors Protest Government's Medical Data Banks

By Joseph Hanlon
Special to Computerworld

AYLESBURY, England – Hospitals here have refused to submit medical records containing individuals' names to two central government data banks. Both computer data banks are said to use patient names to link records to form medical dossiers.

Doctors at the hospitals are concerned that present laws and procedures do not insure confidentiality of records. A medical advisory committee, which governs the four hospitals, voted more than two years ago to delete names and addresses from all information supplied to the data banks. But it did not make the vote public in hopes of negotiating an agreement with the government. Because this was unsuccessful, the doctors recently made their protest public.

Potential for Evil

Richard Pryer, a consultant surgeon and chairman of the committee, argued that no laws control data banks and that the records could be linked with social service and criminal records or be used for political purposes without the approval of either doctor or patient.

(This lack of control was cited by Dr. R.D. Catterall, director of James Pringle House, Middlesex Hospital, London, writing in the *British Medical Journal* in June. He warned that "in the last year or so there's been a new tendency to subpoena the records officer instead of the doctor. The records officer has no relationship with the patient and is likely to give into the court without a fight – but a doctor would appeal to the judge to respect the bond of confidentiality.")

Pryer is worried not only about patient privacy, but also about medical implications. "Medicine depends on talking to patients, and if they don't believe that you will protect what they say, they won't talk to you," Pryer stressed.

Names at Issue

Pryer and his colleagues do not object to collecting medical data, but to the filing of records by name and linking them into a dossier.

And data collection is not new. When a patient is discharged from a hospital in England and Wales, a clerk fills out a standard multipart form summarizing the care he received. One part goes into the patient's file in the hospital and another goes to a central computer data bank.

Primarily these data banks are used to produce statistics on mundane things like bed occupancy rates for both the hospitals and the National Health Service.

The forms tell not only what is wrong with the patient, but also marital status, occupation and religion. In abortion cases, they tell of previous pregnancies. In psychiatric cases they tell if the patient was epileptic, drug dependent or alcoholic, and if he was referred by police or the courts. And the forms contain places for name and address.

15 Data Banks

Altogether there are 15 data banks – a national file for psychiatric patients and a separate computer for each of the 14 medical regions of England and Wales.

Thirteen of these regions use event-based files with unlinked records; if a patient is admitted twice in the same year, he is listed twice. There are no names in these 13 files; names and addresses are included on the standard form only because it is also used as the top sheet of the record by the hospital.

Indeed, hospitals are told they can cross out the name and address on the copy being sent to the central computer, but few do this.

Two of the data banks, however, are patient-based and link all of a patient's records. They are the national psychiatric file, known as the Mental Health Enquiry (MHE), and the Oxford medical region computer, known as the Oxford Record Linkage Study (ORLS). Aylesbury is in the Oxford region and thus submits records to both computers – but with names blocked out.

Linking Records Do What?

Linked records permit scientists to check on the success of various types of treatment and can be used to look for obscure links to such things as undiscovered occupational diseases.

And the records can be used to find people who satisfy certain criteria, both for research purposes and, if a disease pattern is discovered, for checkups.

But this ability to locate patients based on records worries the Aylesbury doctors.

They fear, for example, that the police might use the records to try to find suspects for unsolved crimes, which in turn would open the door for other uses of the file.

And there is also concern that the files can be used to obtain records of particular individuals. Dr. Rosemary Rue, the senior administrative medical officer of the Oxford regional hospital board, admitted that records can be subpoenaed and that the "records belong to the secretary of state" who can ask for an individual record through the chief medical officer.

Finally, there is the danger of error – not a problem for researchers, but a cause for concern if records are used by outsiders. Rue reported that two different people are linked incorrectly nearly 1% of the time.

So far, reaction to the Aylesbury action has been mixed. The Department of Health has coped with the nameless MHE forms without difficulty, sending Aylesbury all of the statistics it sends to anyone.

But Oxford is trying "pressure to get us to conform," Pryer said, by refusing to send the Aylesbury hospitals the statistics that regional hospital boards send to all other hospitals.

The Medical Defense Union has backed Pryer and declared that "there is no legal obligation upon the doctor to disclose confidential information to government departments."

frequency division
multiplexer

FEATURES . . .

INDICATORS: Multi-colored display panel provides indication of four control and two data functions.

MULTI-DROP: Drop one or more channels at a number of locations.

MULTIPLE ACCESS: Multi-drop channels have equal opportunity contention for processor channels.

BUSY-OUT: Busy-Out control of remote modems.

LOOP-BACK: Test features provide rapid system diagnostics.

DATA RATES: Mix 110, 150 and 300 baud channels.

CONTROLS: Processes all modem control functions.

VOICE-PLUS-DATA: Simultaneous voice channel with four data channels.

OPTIONS: Many other optional features.

EIGHT CHANNEL VERSION SHOWN . . . 18 CHANNELS MAXIMUM

SAVE 4-WAYS

1 No high speed modems required.
2 No private line conditioning required.
3 Modular construction permits starting with one channel and adding others as needed.
4 Eliminate long distance phone calls with voice-plus-data.

$465 BASIC UNIT
$15.80 PER MONTH*

$325 PER CHANNEL END
$11.00 PER MONTH*

*3 Year Lease with Purchase Option

Send for FREE Brochure today.

Data Channel Concentrators and Expanders, Modems,
Line Test Units and other Data Communication Equipment

ComData Corporation member of IDCMA
7544 W. OAKTON ST. □ NILES, ILLINOIS 60648 □ 312/692-6107

East-West Relations in DP Areas Show Some Signs of Improving

ATLANTA – There are "a number of encouraging signs" in the area of international cooperation in the computer area, particularly in the relations between the U.S. and the USSR and communist China, Dr. Lewis Branscomb, chief IBM scientist, believes.

Based on a recent trip to the Soviet Union, Branscomb said it is clear "the USSR takes very seriously the need for more sophisticated and aggressive technology for developing resources and managing its large-scale effects, and . . . that their commitment to computers as an indispensable tool in this effort commands the very highest priority."

Friendly Encouragement

In addition, he said, "The Russians are agressively promoting East-West cooperation in these directions, which provides a welcome opportunity to test and enhance the climate for international accommodation."

However, he warned that the U.S. should "temper its optimism with caution. The Soviet leadership has no intention of abandoning its basic political structure and objectives. It necessarily follows that cooperation will have to be carefully nurtured over the coming years, based on enlightened mutual self-interest."

Noting that the U.S. contacts with China came later than those with Russia, he found "the rate of improvement in relations between China and the West even more impressive than the thaw with Russia.

"The Chinese, too, are vitally interested in computers and later this year a delegation of Chinese computer experts is expected to visit the U.S.," he said, predicting that trade with China has been on (and will continue to take) an upward turn.

Noting several cooperative projects already under way between the U.S. and the USSR, Branscomb said the interest of the Russian scientists in developing new DP applications was "no less intense than ours.

"Obviously," he said, "they are making strenuous efforts to develop their own systems industry, but they are also giving high priority to DP applications to important problems in the management of the economy, of resources and of the environment.

"This applications-oriented research provides, in my opinion, a ready candidate for international cooperation, for not only are proprietary and export control problems most easily minimized, but there are many applications problems we share in common . . . opportunities for a two-way flow in scientific experience are realistic," he said.

Aloha! Reservation Okayed

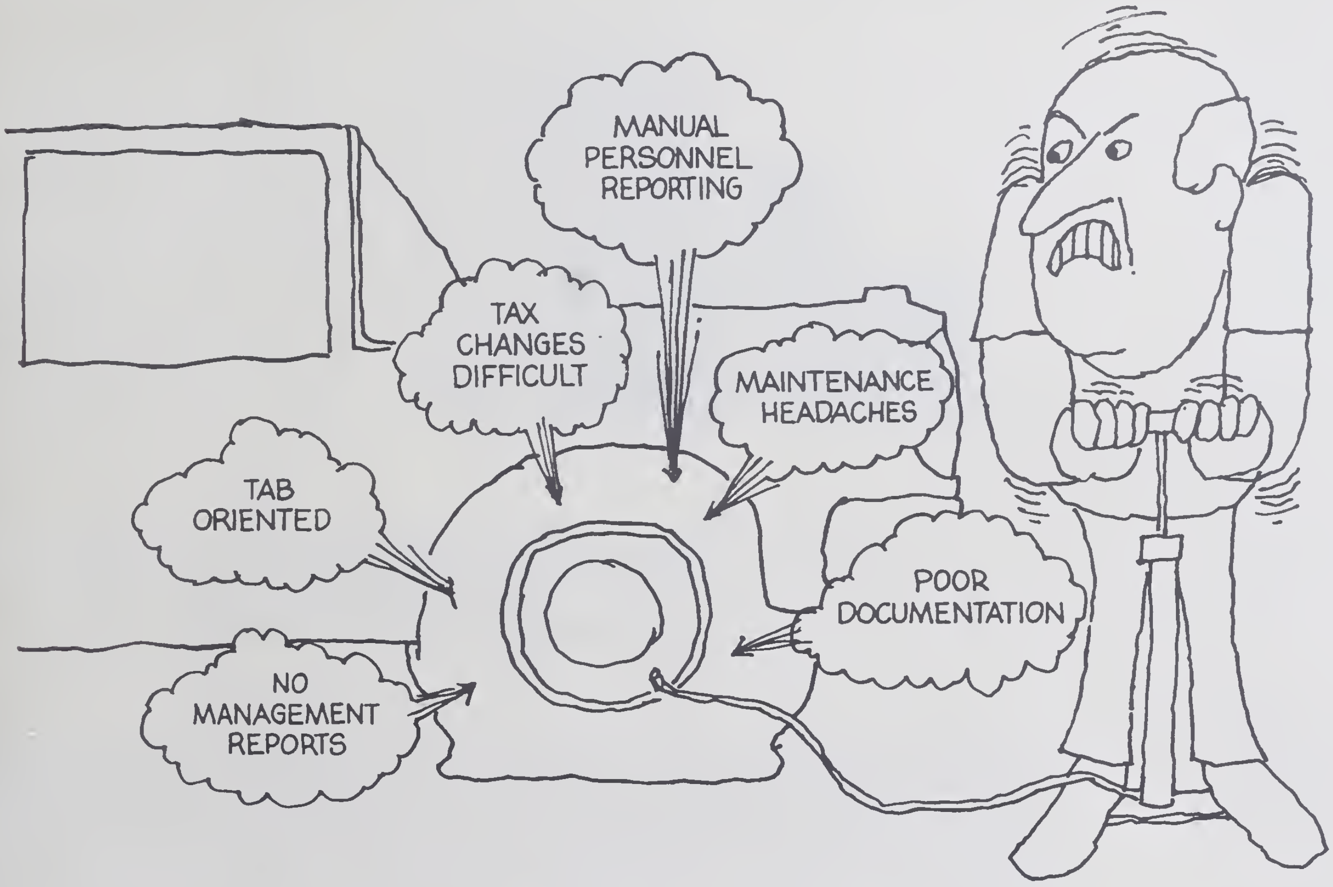
HONOLULU – Reservations Hawaiian-style will be faster now, thanks to a new reservations system recently installed by Aloha Airlines to handle interisland service.

The company will be using 40 Incoterm CRT terminals and purchasing computer time from Mutual Computer Services, Inc.

The computer is being programmed to handle reservations up to 340 days in advance, as compared to the precomputer 45-day advance capability.

Payroll Flat ????

Messy ......?
Slow ....?
Ancient ...?



Get back on the road with

phi payroll systems

Benchmarks against our nearest competitor consistently show that PHI PAYROLL SYSTEMS are faster, more flexible, and easier to run.

PHI Systems Include:

- PHITAX for Easy Tax Maintenance
- Powerful Report Generator
- Remote Terminal Option
- Complete Personnel Capabilities
- Management Reporting
- Canadian Taxes and Reports
- In Excess of 150 Installations
- Operation on IBM S/360 and S/370, B-3500, and H-6000 Hardware.

For more information, just fill out and mail the handy coupon or call James W. Lees at (617) 851-4111.

phi payroll systems are products of

WANG COMPUTER SERVICES
(formerly *phi* Computer Services)
A Division of Wang Laboratories, Inc.
836 North Street, Tewksbury, Massachusetts 01876 (617) 851-4111

Gentlemen:

Your COMPUTERWORLD ad about PHI PAYROLL SYSTEMS interests me — please tell me more.

My Name____________________

Position____________________

Company____________________

Street____________________

City__________ State________ Zip______

Telephone____________________

Computer____________________

Clip and mail today to James W. Lees, WANG Program Products, 836 North Street, Tewksbury, Massachusetts 01876.

Researchers Track Brain Dysfunction

LITTLE ROCK, Ark. – The hypothesis that slower brain wave activity is related to learning disability in children may be proven, thanks to a small computer.

Dr. Roscoe Dykman, professor of psychiatry at the University of Arkansas Medical Center, is using a Varian 620/f-100 to investigate brain dysfunction in slow-learning children.

Responses Measured

Dykman looks for minimal brain dysfunction in such children by measuring their responses to light flashes, sounds and spoken words. The speed and nature of the response is measured through electroencephalogram, galvanic skin response and other neurophysical indicators.

Each response must be tested numerous times, resulting in large amounts of data which are only practically analyzable with a computer, Dykman says.

Dykman and his colleagues plan to use the same computer system to investigate brain wave frequency patterns in normal and learning-impaired children and to analyze the effects of medication on brain wave activity.

Veterans Processed Faster

CW Washington Bureau

WASHINGTON, D.C. – Veterans should get a boost from a new computer system in the Veterans Administration that is expected to cut down the paperwork and time needed for veterans to get educational benefits due them.

As soon as a veteran receives his separation papers from the military, the computer system will automatically generate a packet of papers needed by the veteran.

These include the Certificate of Eligibility required when applying for any VA benefit, an application for education and training and a form for schools to use to certify enrollment, according to VA administrator Donald E. Johnson.

Before, he said, each of these was a separate step for the veteran of the schools, causing paperwork problems and delays in some cases in receiving benefits due the veteran.

The computer-prepared package will also tell veterans the remaining time they are eligible for G.I. Bill benefits, available counseling and tutorial services, how to apply for educational training and which courses may be selected for training.

Fire Chief Wants Hazards Survey

ROCKFORD, Ill. – Where's the fire? A new fire chief is planning beyond the discovery stage of firefighting at the Rockford Fire Department, which may lead the nation in the development of computerized firefighting.

Fire Chief James Cragen is proposing that all businesses, multiple-occupancy and public buildings be surveyed to determine any firefighting hazards such as exposure, available water supplies and dangerous chemicals which must be handled with special equipment.

"All this information can be stored in a computer file. Then, when the alarm comes in, the computer can have all the information to the assistant chief by the time his fire company reaches the fire," Cragen said. Firemen now rely on their own memories when they enter a building and they cannot be familiar with all buildings, he said.

GM Service Manuals Simplified by 'Star'

NEW YORK – A computerized system for determining the readability of various books and manuals has been developed by General Motors.

The Simple Test Approach for Readability (Star) system was developed by the Service Research Center of GM's marketing staff to help make service manuals easier for mechanics to understand.

Formula Selected

After considering the formulae of several readability specialists, the reading ease formula of Rudolph Flesch was selected. This formula is based on the average number of words per sentence and the number of syllables per 100 words.

This information has been programmed into a computer. Material to be judged is fed into the computer and analyzed, with results stated as grade level equivalents.

IBM 370's
are leased to save money.

CSA leases provide long term economy, while customers enjoy the flexibility of upgrading and early termination.

For further information, please call (617) 482-4671

Computer Systems of America, Inc.
a computer equipment leasing company
[illegible]

Send for the 12 questions you should ask of any leasing company before you lease

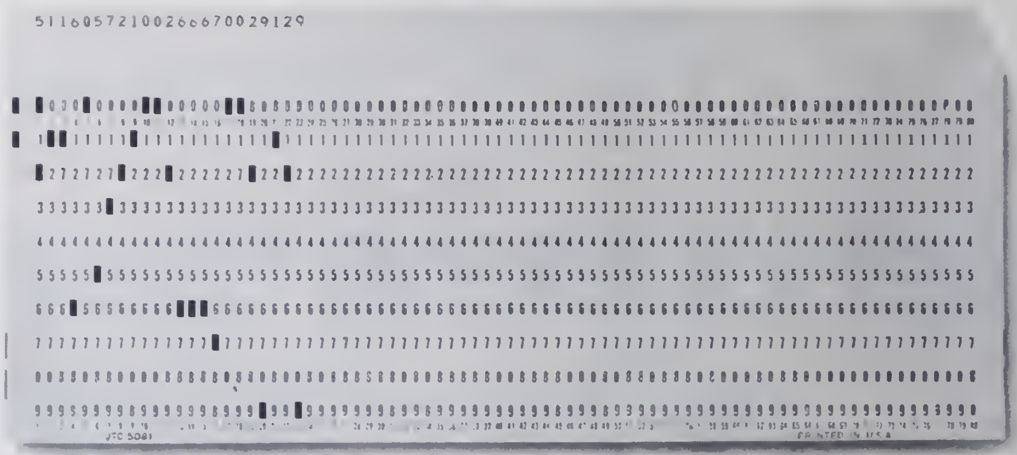
Name
Title
Company
Address
City
State Zip
370 on order ☐ installed ☐
Model Due Date

We're not about to predict the end of punchcards. But we would like to offer an alternative. A data entry system that is superior to punchcards in many ways and can be expanded in ways punch operations can't be.

We're talking about our new IS/1511 key-to-disk data entry system. For data entry it's superior to punchcards because it offers substantial error reduction. There are a total of four warning devices. And errors are so much easier to find and correct on a big screen than on a little punchcard. The IS/1511 data entry station is designed to make the operator as comfortably efficient as possible. Which results in increased operator speed. Naturally, the IS/1511 eliminates cards and card handling. It also makes for greater throughput and better formatting on input and output.

But the IS/1511 isn't just *better* than punchcards. It's

A punchcard is only a punchcard,



Cassette Takes a Detour

CW West Coast Bureau

LOS ANGELES – The episode of the missing cassette system has been solved.

After being dropped from a speeding truck on the Long Beach Freeway, the $4,500 digital cassette system made by Cipher Data Products, San Diego, finally turned up in the backroom of the police department amidst a clutter of bicycles, television sets, shotguns and hi-fi sets.

The system was lost en route from its manufacturer to Dedicated Data Systems, Palos Verdes, a systems house, in February and police here didn't discover they had it until June.

It had been found alongside the freeway.

When Randal Walti, president of Dedicated Data, unpacked the damaged shipping container and plugged in the system, he used it for five days before shipping it back to Cipher for a routine checkout.

Walti said he was so impressed by the system's durability he has asked Cipher Data to send the same one back after its checkout.

'Collect' Consolidates Conn. Police

HARTFORD, Conn. – A computerized information transmission system that will replace the teletypewriter equipment used by most of the police agencies in the State of Connecticut is scheduled to be in operation by Oct. 1.

The On-Line Law Enforcement Communications and Teleprocessing (Collect) system will serve at least 74 police agencies before the end of the year, according to Peter Walsh, public information officer for the Connecticut State Police.

Collect will have access to the FBI's National Crime Information Center's file on wanted persons, stolen securities and stolen property; the state motor vehicle department's file on motor vehicle registration; and the National Law Enforcement Teletype Service in Phoenix, which is a switching station for all police agencies and law enforcement agencies in the continental U.S.

Plans are being made to eventually interface the system with other states and plans are being considered to furnish terminals to the local office of the FBI, the secret service and the nine offices of the state's attorney, Walsh said.

The reduction of waiting time from minutes to seconds for accessing information will improve police efficiency and provide increased protection for the uniformed officer in the field, according to Walsh.

Three Systems 'Carry' Freight

LOS ANGELES – If you want to be taken for a ride, keep in mind that Southern Pacific (SP) has opened its new $39 million freight classification yard at West Colton, Calif.

Three separate, but interfacing computer systems work with the new West Colton yard. SP and Stanford Research Institute developed the crest control system, with a computer and full backup unit located at the yard. This makes a constant and complex stream of calculations for each car as it moves, controlling switching and braking according to the individual car's rolling qualities for soft coupling speeds.

A terminal control computer system works with both the crest system and SP's nationwide Total Operations Processing System (Tops) computers to help plan the flow of traffic through the yard and keep track of all cars, locomotives and cabooses for miles around Colton.

The terminal computer itself is in San Francisco, but SP people in Colton have direct, two-way access to its information through 32 CRTs, and 20 printers and teletypewriters.

different. Its controller is a small computer with a big capacity. So when you want the IS/1511 to take on a new task, you just have it reprogrammed.

And it offers modular expandability thanks to a communications port that permits data transmission at speeds from 1200 to 9600 baud. So you can move data directly from a remote terminal to the central processor. Or to another terminal linked into a data communications system. That means your IS/1511 can become a shared processor, a remote batch processor, a distributed data base manager, a distributed processing system, or a whole data communications system. Which makes it a lot more than a punchcard operation can ever be.

It's nice to know the IS/1511 is so versatile. It's even nicer to know that it's backed up by a service organization that has 96 locations all across the country. No matter where you are, you're not very far from help if you need it.

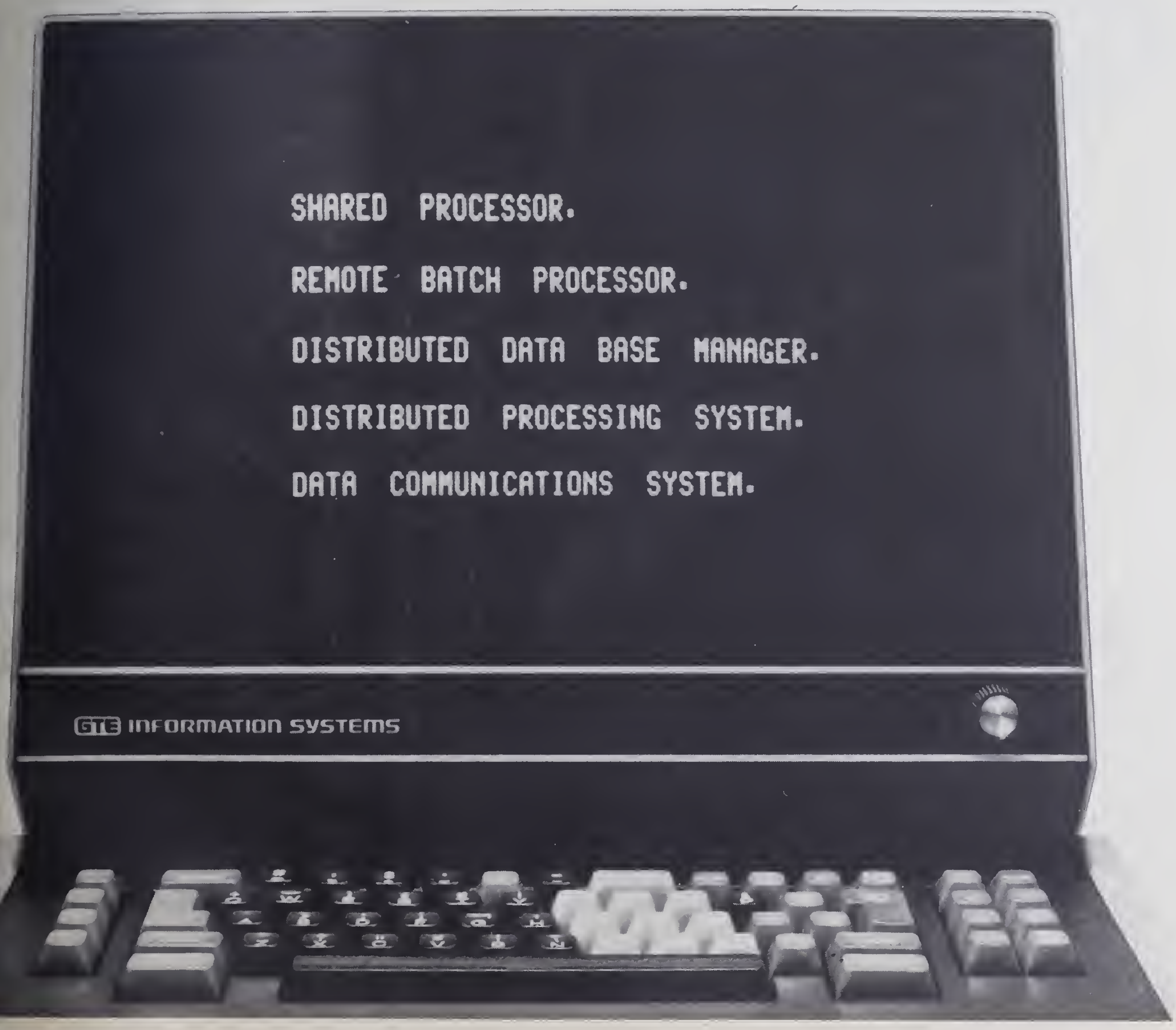
The IS/1511 can be almost anything you want it to be. And GTE Information Systems can provide you with almost anything you want when it comes to data communications equipment: modems, multiplexers, video and typewriter terminals, front-ends, even programming.

Only a company that can offer you almost anything could offer you a data entry system that can be almost anything.

GTE Information Systems, One Stamford Forum, Stamford, Connecticut 06904. Regional offices: Mt. Laurel, New Jersey, 609-235-7300; Chicago, Illinois, 312-332-7800; Anaheim, California, 714-993-6000; Montreal, Quebec, 514-866-9324; Toronto, Ontario, 416-362-1541.

GTE INFORMATION SYSTEMS

but our new data entry system can be almost anything.


SHARED PROCESSOR.
REMOTE BATCH PROCESSOR.
DISTRIBUTED DATA BASE MANAGER.
DISTRIBUTED PROCESSING SYSTEM.
DATA COMMUNICATIONS SYSTEM.
GTE INFORMATION SYSTEMS

ANNOUNCING NEW ISSUE

COMPUTER CHARACTERISTICS REVIEW

Your complete guide to the computer marketplace which prices and evaluates computer machinery worldwide.

Part I. 500 central processors evaluated in 48 hardware, software & price categories.
Part II. A complete hardware and pricing guide to the peripheral units specified for use by the manufacturers of CPU's. Includes discs, magnetic tapes, line printers and card equipment.
Part III. A price index to the U.S. computer marketplace, listing hardware cost of specific configurations for every U.S. manufacturer.
Part IV. Directory of Manufacturers — Worldwide!

Published for 14 years. Revised and reissued every 4 months for up to date developments and price changes. All data is presented in clear and compact tabular format for easy comparison of characteristics and prices. Sold in 58 countries.

250 page booklet $25 per year (3 issues)

Simply Call 617-861-0515

GML Corporation
594 Marrett Road
Lexington, Massachusetts 02173

Information Services
for Professionals

3d-Party Lease Lacks Safeguards of Vendor Pact

By Thomas E. McCormick

Special to Computerworld

In this series of articles on the risks involved in third-party leasing contracts, the author lists informative hints, pitfalls, suggestions and practices all users considering such leases should consider.

Although the costs of leasing some computer equipment from a leasing company compare very favorably with the costs of renting or leasing directly from the manufacturer, a third-party computer lease is more risky.

Computer manufacturers' standard contracts are usually quite strict, but very often not rigidly enforced. Third-party contracts often provide some desirable terms for customers, such as attractive monthly rates, no overtime charges and price protection beyond six months, but they do not provide some of the safeguards which computer users have come to take for granted because of manufacturers' generally lenient practices.

The manufacturers can guarantee delivery dates; they can accede to last minute extensions of installation; and they can provide professional preinstallation planning assistance, even though these items may not be provided for in their contracts.

These considerations are attractive to users and account for generally higher prices charged by those manufacturers.

What About User?

Third-party standard lease contracts protect the leasing company quite well, but usually do not provide very much protection for the user, or assure a high level of service, unless the user specifically requires it in the contract. If a problem such as non-delivery arises, the user should not expect the leasing company to be able to react as quickly as a manufacturer.

The contract should spell out the commitments of each party, and the penalties for noncompliance. Such commitments should include those services and practices which manufacturers engage in even though not bound to do so by their contracts.

Because of the sizeable amounts involved in computer rental and the serious difficulties associated with any prolonged disruption of a computer's availability, it is important to negotiate detailed contracts when dealing with third parties.

Verbal promises may prove very difficult to enforce, and are frequently met by a standard contract clause stating that the written terms recite the entire agreement. The user should require vague or ambiguous terms to be rewritten clearly.

Lessees should beware of provisions which are "subject to" something. For example, some contracts promise prompt delivery "subject to" availability. This means that if the leasing company has the equipment, it will send it to you. Since you are usually committed to the removal of equipment at the same time you install replacements, you may not get one or more vital parts of a system, if the current lessee requests an extension of installation of equipment which was scheduled to be moved from him to you.

Part II will discuss lengths of contacts, automatic extension of contract period and monthly lease periods.

(Thomas E. McCormick spent several years with IBM as a sales representative before becoming director of computer operations at the Seidman & Seidman National Computer Center.)

Step by Step Before You Sign

Here is a recommended sequence of steps for entering a third-party computer leasing contract:

1. List machines and features needed in detail.
2. Define contract terms as you would want them.
3. Review with a consultant or another EDP user. Develop firm equipment specifications, and specify desired length of lease for each item.
4. Request quotations after equipment specifications are firm. Have lessors include copies of their standard contracts for your review.
5. Check references of vendors. Verify that satisfactory maintenance is available in your location.
6. Negotiate with vendors until terms are resolved. Get everything in writing.
7. Obtain legal review before signing the contract.

Charts Charted by DP

WASHINGTON, D.C. – The National Oceanic and Atmospheric Administration has announced publication of the first nautical chart produced largely by computers, the result of a 10-year, $25 million program expected to be fully operational throughout the nation by 1980. The first chart covers a small portion of the Mississippi Sound in the Gulf of Mexico.

When the program is fully operational, almost all data now familiar to the users of charts will be programmed for the computers – information on shipwrecks, favorable fishing sites and navigational aids. Normal working time on new charts will be reduced from 12 to 18 months to as little as four months. Chart revisions which took about five months will be completed in 90 days or less.

Antitrust, an Historical Perspective – Part VI

United Shoe Case Significant for Economic Analysis

WASHINGTON, D.C. – The U.S. Government's antitrust case against United Shoe Machinery is the classic case involving a firm in a lease-base industry, and since the computer industry is also essentially a leasing industry, it should be mentioned prominently in the government's case against IBM.

At the same time, it also exemplifies the importance of market definition and the place of market power and market control in a large antimonopoly case.

It should also be noted that the style of leasing engaged in by United Shoe was far different from that presently employed by IBM.

For example, most of the leases for shoe machinery equipment were for a 10-year duration – while the longest offered now by IBM covers only four years, and the majority of IBM leases is for even shorter periods.

At the same time, the United Shoe machinery leases generally committed a user to using only equipment made by United Shoe and required the user to get all of his equipment from United Shoe and from no other vendors.

Additional Business

In addition, they also often required the user to do a certain specified amount of business with the large shoe machinery maker, unlike the present leases common in the computer industry which can be for one individual piece of equipment or for several.

At the same time, however, the United Shoe case is one of the first where a great deal of modern economic analysis entered the picture in an effort to define market power or market control on the part of a monopolist. Much of this work was done by Carl Kaysen of Harvard University.

Kaysen found undesirable market power could be defined as "the ability of a firm to operate over time in a way different from the way a firm in an economist's model would be forced to behave by competitive forces."

The model used has firms accepting a market price, producing a product at which costs approximate price and pricing close to cost with the allowance for profits and risk capital.

Under the models of a competitive industry, the firm would have to produce all of its products following this model and would make only those profits necessary to keep the firm in business. In addition, the profit on each piece of equipment would be relatively the same.

While largely agreeing with this definition, the judge who heard the case broadened it somewhat – substituting the idea of market control for that of market power.

The idea of market control, besides embodying the economist's model, also includes the ability of a firm to control certain other aspects of its existence, such as product design, the direction and timing of research and innovation and the terms on which the product will be offered to users (sale or lease).

Relevance to IBM

All of these aspects are certain to be related to the IBM case as the court tries to determine whether in fact IBM has the market control or the market power to determine product design without worry from competition, and whether it can set its own pace for product innovation without reference to what other firms are doing in the business.

Another aspect of the United Shoe case will apply here, in all likelihood. United Shoe argued that the leasing business was necessary to its research program and that its position in the market was thrust upon it by its superior research and development efforts.

But Kaysen noted that basically that argument amounted to an assertion that monopoly control over revenues was necessary to conduct research economically, a fact disputed since other firms in the industry had impressive research credits and were responsible for many innovations in the business.

In addition, on the question of leasing, Kaysen found the leasing system, coupled with the ability of United Shoe to keep second-hand or used equipment virtually off the marketplace, tended to reduce competition and make it harder for firms to enter into the business.

Another important aspect of the Kaysen analysis of the United Shoe case is the evidence he found of the ability of United to discriminate in its pricing of products.

Since under ideal competitive terms found in the economist's models of competition a firm would not be able to discriminate in such pricing, the ability of United to do so was taken as a prime example of its market power or market control.

At the same time, the case also reiterates another point found in the Alcoa case. United Shoe, like Alcoa, was found guilty of monopolizing even though some of its actions would be completely legal if it did not wield a great deal of market power.

Traditionally Better

COPE® 1200

When you want access to a big computer, compare the price/performance advantages of COPE 1200 Remote Batch Terminals. They're traditionally better. COPEs have been delivering more efficient access to large-scale systems since 1968 when data communications was in its infancy.

Today, over a thousand COPE terminals are serving some of America's largest corporations. They're bringing the processing power of IBM, UNIVAC, CDC and other large-scale computing systems to business, industry, and government users. And they're still delivering a better combination of price/performance.

You can select the exact COPE terminal you want from a variety of configurations. In any size, COPEs give you industry's best throughput/cost ratio. Use ordinary voice grade or Telpak telephone lines . . . you'll still be throughput dollars ahead. And for the utmost in utilization, you've got COPE MODE, the full-duplex transmission mode we first offered years ago. (Nobody else could offer full duplex then and nobody else is providing it today in a production environment.)

COPEs give you a way to get there — fast and economically. Choose from:

- Card readers: 150 to 1200 cards per minute
- Line printers: 50 to 1500 lines per minute
- Half- or full-duplex communications modems operating on voice grade telephone and Telpak circuits from 2 KB to 50KB
- Paper/Mylar tape reader/punch
- Card punches: up to 200 cards per minute
- Core memory expandable from 4K to 16K
- Magnetic tape: 7 or 9 track — 200, 556, 800 or 1600 BPI
- Multiple communication interfaces: ordinary voice grade lines, co-axial cable or Telpak lines

What's more, COPEs are supported by a full library of software simulation packages plus several utility packages. Included is a powerful Report Program Generator (RPG) package providing comprehensive stand-alone processing capabilities.

Compare the price/performance advantages of the COPE 1200. Call (214) 241-0551 or the COPE representative nearest you, for complete information.

C9

TO: Harris Communication Systems, Inc.
11262 Indian Trail/P.O. Box 44076
Dallas, Texas 75234 (214) 241-0551

Please send more information on COPE 1200 Remote Batch Terminals.

I'm also interested in your:

☐ COPE 4705 Communications Controller
☐ COPE 65 Communications Controller
☐ COPE 1000 Series portable keyboard terminals
☐ Please Have a Salesman Contact Me

Name
Company Telephone
Street
City State Zip

HARRIS
COMMUNICATION SYSTEMS, INC.
a subsidiary of Harris-Intertype Corporation
11262 Indian Trail/P.O. Box 44076/Dallas, Texas 75234 (214) 241-0551

Canada: 1400 Don Mills Road/Don Mills, Ontario (416) 449-8571

Editorial

Tennis With No Love

AT&T may finally have gone to the wall with its obviously indefensible position that users who innovate with customer-provided equipment are causing harmful effects to the phone system. (see story on Page 1)

The AT&T claims, followed by FCC requests for more detailed information, have now taken on the aura of a tennis match. No doubt if this endless debate is allowed to continue, Bell will finally manage to come up with an isolated case to "prove" its point.

Perhaps the FCC should throw the ball back into AT&T's court for one final time. It was AT&T that initiated the controversy back at the "dawn" of interconnection in 1969.

Since then, it has managed by implication to indict the large body of customer-provided equipment, users and the associated suppliers.

If the matter cannot be resolved to support the AT&T allegations, then the commission should force Ma Bell to publicly admit that she blew it. That is the least that the unjustly accused users and vendors deserve.

GRAND OPENING
~~SOON~~
~~SHORTLY~~
~~ANY DAY NOW!~~
MOMENTARILY!!
IBM's FIRST MINI-COMPUTER (rumored since 1971)

What's Sooner Than 'Momentarily'?

Improving Capacity to Sell Ideas Can Go Long Way

Management

By Frank Greenwood, PhD

Improving your capacity to persuade and sell can better your results in all sorts of management situations. For example:

- You badly need a second operator on the 4 p.m. to midnight shift, but cannot get the budget.
- A senior executive constantly insists that you can single-handedly solve many of his problems if you will just locate the appropriate software package.

Taking the view that these are selling situations puts you in the frame of mind to tackle them effectively.

Know Other Person's Needs

In a good business deal everyone gains and no one is gouged. Therefore, you need to know the other person's needs, so you can tell how you can benefit him. That is, he has to see how you can benefit him before he can do business with you.

Accordingly, you tell the budget committee that a second operator will improve the output on that shift by 40%, providing accurate reports faster at a considerably lower cost (than the cost of wasting a potential shift productivity gain of 40%).

Begin by defining your objective; maybe it is to get added budget for another operator, or to handle a manager whose ideas seem to come from science fiction, or to deal with programmers whose salary demands cannot be met.

Then prepare carefully to achieve your objectives. Assume you have made a real – but unsuccessful – effort to explain to the science fiction fan that acquiring a hypothetical package probably means that it either must meet all of his requirements or that he must change his practices to conform to the packaged system.

Your best move now may be to talk with this fellow again, thanking him for his concern, indicating that you are just as anxious as he is to help solve the organization's problems, and then suggesting he get the documentation on his (probably still hypothetical) packaged system and present it to the computer users' committee.

This may defuse him. and maybe he will locate exactly what is needed. In any case, preparing carefully to deal with his somewhat unreal demands improves your chances of effectively handling this man.

Turn the Tables

After defining your objective and preparing to talk with your associate, then present your ideas to him, driving home the benefits to him resulting from his agreement. Assume your programmers are pressing hard for big raises. Your approach might be to point out that acceding to their demands would create a high-cost programming group.

Benefits to them associated with easing up on their demands would be: no one would be laid off (the probable method of getting the budget to pay the increases); the work load would not go up (the result of having fewer programmers); and the installation would not be turned over to a facilities management firm (a logical way to control rapidly increasing costs).

Point by Point

As you talk with a programmer, make sure he understands and accepts each point before you move to the next. "With the total annual increase in programmer salaries which these raises would require, do you see that the obvious source for the increases would be laying off a programmer and using that money for the other salaries?"

Objections can often be handled by repeating the objection in strong terms (to show him you understand it and take it seriously). Then, agree with him. Finally, treating his objection as a request for more information, present further benefits.

For example, "I can understand why you believe there are better ways to provide increases than by laying off a programmer. But, we get just so much for raises, and the operators, analysts and others deserve increases, too. We can avoid a big jump in our work load by trimming our demands so we don't get a programmer laid off."

Ask For Agreement

Close your presentation by asking for his agreement. Maybe you can assume agreement; e.g., "Then I will send in the lower salary recommendations, OK?"

Perhaps it is best to offer a choice: "Should we send in the lower increases with uniform percentage raises for each of us, or should we spread them according to merit?"

This powerful tool of selling your ideas is summarized in Sidney Edlund's fine new book, *There IS a Better Way to Sell,* American Management Association, 1973:

Objectives: Set definite objectives for each meeting.

Preparation: Prepare specifically for each discussion.

Inquiry: Uncover his problems, then help him.

Benefits: Demonstrate what you can do for him with enthusiasm.

Wrap-up: Get acceptance on each major point before proceeding.

Objections: Always roll with the punch. Agree with him, then answer. Repeat objection, then answer. Treat objection as request for more information.

Closing: Always ask for agreement. Assume it. Close on minor decision; e.g., a choice.*

**Reprinted by permission of the publisher from There IS a Better Way to Sell, by Sidney Edlund, copyright, 1973.*

Frank Greenwood is computer center director at the University of Montana.

"I'm in a particularly foul mood today, so sympathize with everybody as they come out, hmm."

Letters to the Editor

HEW Report Beats Societies to Punch

The HEW Report will cause the issue of privacy versus openness to be fully developed. It saddens me that most of the computer societies have been beaten to the punch by HEW.

I have never understood why ACM, for instance, is more interested in the security of hardware than in the effect of a wired integrated nation on privacy and public control.

In the professional community we must become more aware of the effect of our systems on single individuals. It is dangerous to talk of a UID when one can read of the monstrous and cruel mistakes made by NCIC and other data banks.

One hears talk of efficiency, but efficiency for whom? Efficiency is an over used word which conceals the giving of more power to those who already have enough. As for the uniqueness of the UID – the most important problem in most data banks is not duplicate names but erroneous unprovable garbage.

I propose to *Computerworld* that it sponsor a public conference of people in EDP and users, the majority individuals not groups, to air some of the above concerns.

David J. Blow
Washington, D.C.

IBM Stock Split Explains Prices

Would you please explain how the IBM price range on your Stock Trading Summary Report was 299-340 in the Aug. 15 issue when a high of 444 was recorded on Feb. 22?

Richard Schlenker
Phoenix, Ariz.

During the period between February and August, IBM stock split, and the lower price reflects an adjustment for that split. Ed.

On the 'Horrors of Emulation'... ...or 1401 Applications Will Never Die!

Burroughs recently designed a 1401 emulator for its new 1700 series. Computerworld believes the present widespread use of 1401 emulation is a challenge to the profession as well as a scandal: "It's a perfect example of how to misuse the power of our hardware and our people." [CW, Aug. 22] These letters are in reply to this editorial stand.

● 1401 Programs Were Effective 10 Years Ago, Why Change?

Your recent editorial on Burroughs' announcement of 1401 emulation for the B1700 displays an attitude that is distressingly unrealistic and anachronistic:

- Functioning computer programs represent substantial capital investment, not casually ignored. It would now be marketing suicide to offer a new general-purpose system that is *not* in some fashion compatible with its competitors and predecessors.

Even "No. 1" appears increasingly constrained to compatibility – witness the emphasis on detailed compatibility in the VS releases.

- As recent controversy about consumer billing practices exemplifies, the 'revolutionary' progression through the computer generations seems to have *impeded* rational, user-oriented systems development rather than advancing it.

We spend our time fighting the new, incompatible machine rather than the problems.

Remember the maxim: Revolution, in the long run, preserves the status quo.

- Emulation capability is the heart of the B1700 architecture, not a pasted-on market-requirement afterthought. I expect to see other emulation package announcements from Burroughs in the future, not necessarily limited to the replacement market.

Why not an emulator for an APL machine . . . or a LISP machine . . . or a sensible PL/I machine? New theory development in the area of program and data structures is outrunning the design-to-delivery cycle, making emulation almost the *obligatory* approach. Can the purchasers of 370/155's and 165's deny this?

Robert Higgins

St. Davids, Pa.

● Some DP Departments Never Should Have Left the 1401

In our rush towards advancement and "state of the art," we forget that there are people who should never have left the IBM 1401, cost/performance-wise. We also forget in the throes of sophisticated system building that perhaps emulation is a viable means of letting stand what works, hopefully operating those systems at reduced costs while developing new systems in native mode.

When will we in data processing wake up to the fact that EDP is *not* a cost-saving activity anymore? Opportunities for cost-saving have been largely obtained in our brief history. What remains, however, if a company is to grow, is to use the EDP system as an *opportunity maker.*

When IBM introduced the Model 30, permitting emulation of the 1401, its biggest selling point was the ability to do the 1401 work in 0.6 of the time at a lower cost. Systems such as Dualcomp permitted multipartitioning, and, of course, the Compatibility Operating System permitted a mix of native as well as emulated jobs.

I have no argument that jobs written in the native mode of any computer are more efficient to write or operate. That fact stands by itself.

We have all but abandoned our native mode systems anyway, with our Cobols, Fortrans PL/Is, etc. But your editorial makes two very blatant and perhaps erroneous assumptions:

- That all "old" systems are by their very existence "ugly and wasteful practices." That argument will just not hold water. Some of those systems are still good, cost/performance-wise, and should be left alone. "New," or "bigger" are not at all synonymous with "better."
- That in doing so is a misuse of people, assuming that "if you're not where the action is, you're nowhere." Not every firm must program in the latest technique, the latest hardware, the latest software, the latest language to be a profitable member of the DP community.

The cover story of this *Computerworld* issue [Aug. 22] depicts the losses at least one user experienced in going to VS. If Burroughs can take over a company's 1401 operation at less expense and still provide the opportunity for system development and growth, then I say, "Go to it."

Kenniston W. Lord, Jr., CDP
Vice-President

Ware Associates
Hudson, Mass.

● Fast Flow of New Systems Impedes Rational Progression

Although I usually find myself in agreement with the editorial policy of CW, the short "Horrors of Emulation" editorial finds me in strong disagreement on several counts.

Let's consider CW's view that the Burroughs decision to offer IBM 1401 emulation on their new 1700 series, "is the prostitution of a beautiful new machine." Let's look at this from two viewpoints – Burroughs and the potential user.

- Burroughs knows full well that there are "thousands of installations (that) continue to operate in the (1401) mode." They have a fine piece of equipment – but, in order to install that fine equipment, they must either:

a. convince potential users to reprogram those thousands of 1401 programs;
b. offer free translation service; or
c. provide an emulator.

Alternative "a" is hopeless.

Alternative "b" is a viable possibility – but, if you've had much experience with translators, you know that it is often easier to rewrite 1401-size programs, than resolve those last few problem instructions which won't translate.

So, Burroughs made the obvious choice to make their equipment more marketable – an emulator.

- Now let's look at the users.

The user has maybe 100 programs that most likely shouldn't have been put on the 1401 10 years ago. Simple unit record/EAM applications were dumped on the 1401 when the 402s and 407s went out the door.

When Mr. User took delivery of his 360/30, he was not about to reprogram those 100 jobs (which were now running very efficiently).

First, it wouldn't be worth the rewrite cost; and second, Mr. User had a big backlog of more important development projects on the drawing board. So he picked up CS30 for his 360.

Probably, somewhere along the line, he tried out an Autocoder-to-Cobol translator on a few test programs. Most likely, after his programmers had struggled through the non-translatable instructions, he ran a few tests.

That 1401 check-printing program that took two hours under CS30, now took a solid four hours. So he had one of his crackerjack Cobol programmers sit down and reprogram the job in Cobol. Aha! . . . now the job only took one hour and 50 minutes . . . a savings of 10 minutes a month.

Let's see, all he had to do is reprogram those 100 jobs in Cobol and he would save 1,000 minutes a month. The rewrite task would cost him about $100 to $150 per program (programming, debugging, test-time and documentation) . . . or about $10,000 to $15,000; and tie up one programmer for a year.

Only now he found out that 50% of the programs were one-a-year jobs, and 20 more were run quarterly. And that's when he decided, "the heck with it."

Mr. User has a few more options, of course. He could go out and purchase a reconditioned 1401. (I understand that quite a few organizations have made such a "scandalous" decision.)

Or he could look at a small Burroughs machine. But unfortunately (let's assume) Burroughs doesn't have an emulator, so he's still faced with a conversion or rewrite.

And finally, Mr. User has one more choice. When that 1401 checkprinting job needs a major revision or is replaced by an entirely new system, he can get the job done.

'Til then, he will stick with emulation. Now maybe that's "scandalous" or "unprofessional," but remember, he's still faced with that backlog of important, new development projects, and he's trying his best to keep staff-size and personnel costs within reasonable limits.

In my not-so-humble opinion, it's far more scandalous and unprofessional to reprogram applications which are reasonably efficient, with the acquisition of each new generation of equipment . . . or to jump on the new-generation bandwagon and bring in that new CPU, when the old one can handle your current and potential workload at a reduced cost.

As you can see from our hypothetical example, there are several other perfectly logical viewpoints, and it seems to me that Burroughs made a wise and expedient decision in developing a 1401 emulator.

Ron Stewart
Consultant

Des Plaines, Ill.

"We'd be the first to admit, of course, that there is some controversy over whether we should rewrite those 1401 applications."

● Horrors of Conversion Often Outweigh the Horrors of Emulation

Emulation may be wasteful in terms of computer processing efficiency and perhaps it does "prostitute" the 1700.

However, on Page 25 [CW, Aug. 22] of the same issue Dr. Gerald Brock points out the harsh realities of being a supplier and I quote: "Because the customer makes a large investment in programs specialized to his use on a particular type of machine, he is effectively eliminated as a potential customer of a manufacturer which does not make provision to translate the customer programs or provide a machine on which existing programs can be run."

The responsibility of efficient use of computers rests squarely on the user. It is the user requirements and needs that dictate the products a supplier must furnish to be competitive.

Furthermore, as long as IBM continues to supply emulation on their series of equipment, other vendors must follow suit or lose additional orders to No. 1.

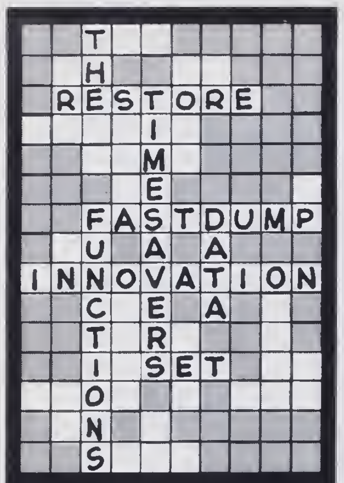
Consider the DP manager who is faced with budget constraints in programming and also pressure to utilize his people to bring up new applications rather than reprogram existing systems. His only economical avenue may be emulation. After all, management expects him to achieve the transition from one machine to another with a minimum of effort and disruption.

Emulation may be "damned" and "prostitute" new equipment, but in many cases it is the only way a transition can be accomplished and also meet management's demands.

I am no more in favor of the use of emulation than anyone else but sometimes the "Horrors of Emulation" are only exceeded by the "Horrors of Conversion."

Robert J. Edgren
Director
Data Processing Department

The Navajo Tribe
Window Rock, Ariz.



Phone or write for a
free 30-day trial
or more information

INNOVATION
DATA PROCESSING
925 Clifton Avenue
Clifton, NJ 07013
201—777-1940

DP Research Fads Sometimes Sail on Stormy Seas

By Miles Benson

Special to Computerworld

There are computing research Fads . . . areas where someone's research catches the research community's fancy, and everybody starts working in that same area.

There becomes a sort of social acceptability to working on a particular problem, just because others are.

Want some examples? Well, list processing languages were think tank favorites about eight years ago. Time-sharing systems pop up perennially. Compiler-compilers are on the wane now, but they were big three years ago.

There's also a positive side in all that talent concentrating on a problem area, pursuing it to exhaustion, and moving on to newer and perhaps greener fields.

This is the story of one of those Fads. The Natural Language Processing Fad.

Back around 1968, the universities and research agencies were hooked on the dream of computers conversing in natural language.

The dream seemed attainable. Pilot studies had shown that trivial subsets of English *could* be translated.

At a company I will call United Aerospace, the computing research group decided NLP had potential for the problem-solving requirements and began a two-man commitment.

The NLP pair was sharp.

They designed a data base technique with intricate mechanisms for interrelating vocabulary words. They experimented with quantities of manageable vocabularies.

They began exploring the problems of natural language ambiguities (how do you handle "time flies like an arrow?"). They built a preliminary program, one which translated simple sentences.

Their program took some mind-boggling side trips when the input going got rough, sometimes.

But still, there was progress.

Outside the technical realm, though, a storm was brewing.

This particular storm is periodic in its appearance in the corporate world, and goes by the name "overhead reduction." Its effect on company end-item projects is minimal, but it has been known to cut vicious swaths through research groups, tossing intricate projects about with destructive abandon.

But NLP was a favorite project. Research management pulled out all the stops to save it. NLP became a programmer's dream, an engineer's dream, a manager's dream, the solution to everyman's computing problems.

NLP would replace Fortran, JCL and RPG in one fell swoop.

It would be nice to report that NLP weathered the storm, with all that support. But it didn't. Word got around that other NLPs at other companies were far from solving the problems of Natural Language Processing.

Some had already thrown in the towel.

Management salvaged enough overhead for some wrapup documentation, and when that was done it went on the same shelf.

Time passed, and the Natural Language Processing fad moved on to some other area. NLP still sits on the shelf, somewhere; but it looks doubtful that anyone will care enough now to bring it down. Not even to look it over . . . a true DP fad victim.

We build reliability

When you decide to expand, enhance, or replace the memory in your System 360/370, cost is only one consideration. Almost any supplier of compatible memory systems can claim to offer you substantial savings. But can they deliver systems that will give you reliable, trouble-free performance? And are they willing to back up that performance anywhere, anytime? For that matter, will they be around to stand behind it? When you choose EMM, all the answers are "yes".

Why EMM? Let's start with *experience*. EMM is one of the world's largest independent memory manufacturers. Most of the mainframe computer companies use our memory systems or components.

Our *technology* goes right down to basics. We manufacture our own stacks and system modules. Add the electronics for the total memory. And give them all the same degree of manufacturing control that put us on the Apollo and Skylab programs. EMM was the first independent memory company to receive IBM approval for 360/65 CPU maintenance when add-on memory over 1 megabyte is installed.

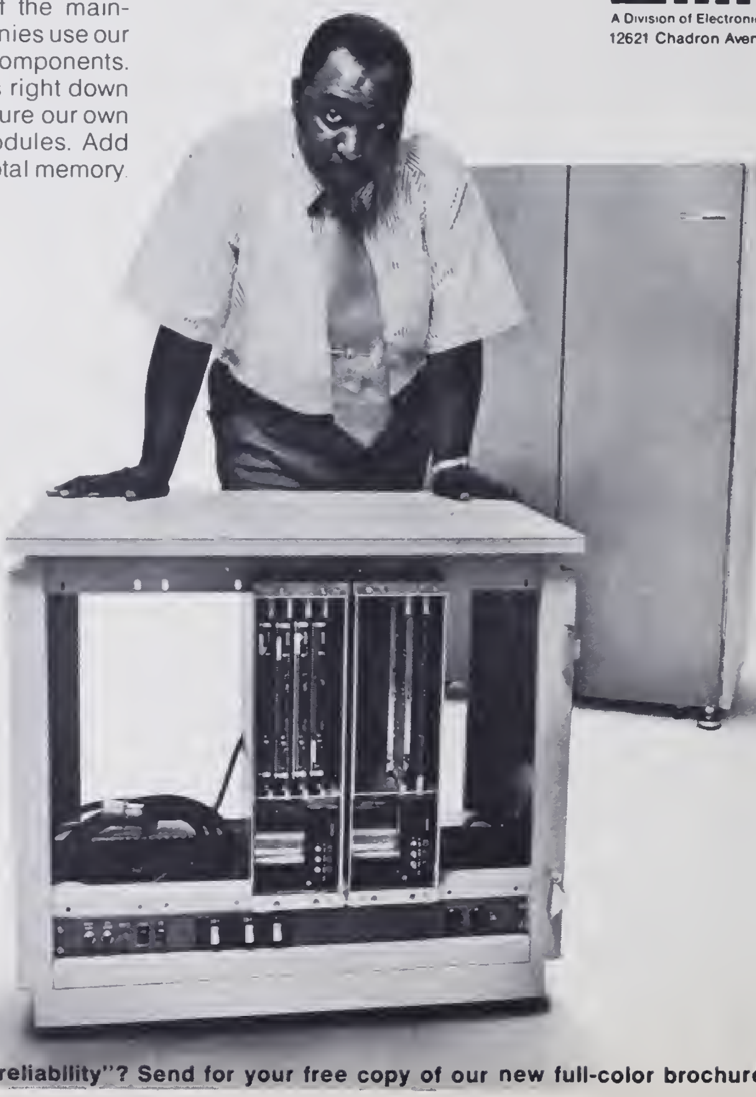
We have the *stability* of a major company committed to the memory market. We'll be around tomorrow and a lot more tomorrows to come.

But one of the main reasons for our many *satisfied customers* is the reliability that's built into each system under the watchful eye of Bob Allison. It's part of his job to make sure no system that isn't functionally perfect ever gets as far as the shipping dock.

So if you're interested in 360 or 370 compatible memory, call one of our Computer Products division marketing specialists at (213) 644-9881, or contact our nearest office.

But don't ask for Bob. He's too busy trying to make sure you'll never have to worry about memory-related downtime again.

EMM COMPUTER PRODUCTS
A Division of Electronic Memories & Magnetics Corporation
12621 Chadron Avenue, Hawthorne, California 90250



How do we "build reliability"? Send for your free copy of our new full-color brochure for the answer.

There's an EMM office near you.

SAN FRANCISCO
BURLINGAME 1818 Gilbreth Road
CALIFORNIA Suite 214
94010 (415) 692-4250

LOS ANGELES
LOS ANGELES 10960 Wilshire Blvd.
CALIFORNIA Suite 320
90024 (213) 477-3911

CHICAGO
DES PLAINES 1400 East Touhy Avenue
ILLINOIS (312) 297-3110
60018

BOSTON
WELLESLEY #4 Wellesley Office Park
MASSACHUSETTS 40 William Street
02181 (617) 237-4800

DETROIT
SOUTHFIELD 21411 Civic Center Drive
MICHIGAN (313) 352-1040
48075

ST. LOUIS
CLAYTON 130 South Bemiston
MISSOURI Suite 101
63102 (314) 863-0015

NEW YORK
SADDLE BROOK 299 Market Street
NEW JERSEY (201) 845-0450
07662

CLEVELAND
CLEVELAND 6500 Pearl Road
OHIO (216) 884-1980
44130

PHILADELPHIA
ABINGTON 947 Old York Road
PENNSYLVANIA (215) 887-4940
19001

PITTSBURGH
PITTSBURGH 395 Seven Parkway Center
PENNSYLVANIA (412) 921-1221
15220

DALLAS
DALLAS 2655 Villa Creek
TEXAS Suite 280
75234 (214) 243-2374

HOUSTON
HOUSTON 1200 South Post Oak
TEXAS Suite 104
77027 (713) 626-3592

WASHINGTON, D.C.
ANNANDALE 7617 Little River Turnpike
VIRGINIA (703) 941-2100
22003

BRUSSELS
BRUSSELS Rue Du Luxembourg #19
BELGIUM First Floor
1040 (02) 12-30-80
TWX: 846-22462

LONDON
FELTHAM 92 The Centre
MIDDLESEX 01-751 1213/6
ENGLAND TWX: 935187
TW 13 4BH

PARIS
PARIS 17 eme 92, Rue Jouffroy
FRANCE 227-5619
TWX: 21 311

EMM COMPUTER PRODUCTS

Town's Tactics Questioned

When Does User Bait Vendor?

The Taylor Report

By

Alan Taylor, CDP

In my recent coverage of "Baiting-and-Waiting" a number of users attacked the tactics of manufacturers. They said that after the proposal was accepted, something often went wrong. In some cases, for example, programming support disappeared or delivery was delayed.

But baiting is not one-sided. In the middle of August I attended a suddenly called meeting of my local vocational school computer advisory board. I am on the board.

You may remember the South Middlesex Regional Vocational School in Framingham, Mass. Like most other residents, I only became aware of the vocational school in January when I discovered the school was about to sign a contract for an IBM 370/135. The 370/135 was "needed" to educate 15 parttime 10th grade vocational students in data processing.

The students were to be trained as top-level systems programmers. They therefore needed a "multidimensional atmosphere" throughout their three-year course.

In the ensuing ruckus, strong indications appeared that the official open bid operation was not very open. Two manufacturers – IBM and Honeywell – had employees sitting on the computer advisory board. IBM had been selected; Honeywell was protesting. No others were apparently in the running. IBM, letter-of-intent in hand, was pressing for a signature so delivery could be made in April. A computer coordinator was just being hired. (He happened to be a Honeywell sales representative on the account).

Residents Concerned

But then residents expressed their opposition to the high cost of the IBM computer, and they also expressed doubt as to whether students at the vocational school would be able to get jobs as systems programmers.

So the school retreated, and said it had called for additional computer power to allow neighboring towns to have a regional DP center. If the towns did not want such a facility, the school would absorb the extra capabilities itself.

The school board was able to jump back into the frying pan and out of the fire when a new proposal turned up.

The former Honeywell employee and now computer coordinator recommended a Honeywell system, with an educational discount, and it was authorized by the school board. The cost of the revised Honeywell proposal was two-thirds less than the original IBM proposal – $4,750 per month instead of $15,000 per month. The contract was signed June 12, and ratified by Honeywell June 22.

Only three weeks later, on July 16, the school wrote to Honeywell asking the firm to cancel the contract in a "low-key" manner. Six days later another letter told Honeywell that no further support would be accepted or utilized.

The July 16 letter does claim there had been a detailed legal and technical review, but the only review I have found is dated July 23 – a week afterward. None of the seven points in this review referenced anything in the contract, and none

(Continued on Page 14)

High principles
supported by professional understanding in EDP executive search.

LESLIE, KAVANAGH INC.
505 Fifth Avenue, Suite 1300
New York, New York 10017
(212) 661-0670

Specialists in EDP Professional Search

TRADING YOUR 360 FOR A WHAT?

Then you've been spending some restless nights worring about ·

- **Virtual memory** — what does it really buy?
- **Total monthly rental** — isn't it higher than you expected?
- **Newly promised software** — will your small staff ever get it running smoothly?
- **DOS on 360's** — is it really frozen?

We've asked those same questions and come up with some pretty interesting answers. They're in our summer newsletter – yours for the asking.

NATIONAL COMPUTER RENTAL, LTD.
415 Madison Avenue, New York, N.Y. 10017
(212) 532-1500
A Member of The Flying Tiger Group

UVI Is Not the Only Telephone Company In Town

That's Why We Offer Direct Line Telecommunications Service at Rates Up to 30% Below Your Present Cost

United Video, Inc. (UVI), a majority-owned subsidiary of LVO Cable, Inc., is an organization based upon competitiveness, one of the new breed of specialized common carriers that is offering communications users an *economical* and *reliable* alternative to standard direct line phone service for voice and data traffic.

The basis for UVI's existence is our ability to provide you a better communications service at a lower cost, through our expertise in advanced microwave transmission technology. But as a newcomer to the common carrier industry (although we've carried television signal traffic over our facilities for some years), we know we'll have to prove ourselves and our service.

We'll do this in several ways. The first is by offering you more attractive rates for communications services. Depending on length of contract, UVI can save you up to 30% on your present direct line phone costs for voice and data transmission between selected cities. Think about it. *Up to 30%*. And of course, at UVI, direct line communication service is our total common carrier business. Your requirements and needs are our biggest concern — as our customer you don't take second or third place to any other consideration. And your reliability with our network is guaranteed to be at least as good as you currently experience with your present service.

Primary basis for the UVI transmission capability is a 700-mile microwave network now being constructed between Dallas and St. Louis and also linking Oklahoma City, Tulsa, and Kansas City, which is slated for completion in late 1973. In addition we have interconnect arrangements with other common carriers that enable us to offer an integrated Coast to Coast and North to South transmission service linking most of the nation's major metropolitan areas such as New York, Chicago, Houston, Atlanta, Los Angeles, and San Francisco. United Video is here, we're highly competitive, and we want to talk to you about your communication requirements. For a free corporate folder on UVI and precise rate data and other information, write or call collect to United Video, Inc., Attention: Marketing Department, P.O. Box 2686, Tulsa, Oklahoma 74101, (918) 587-1171.

UVI
UNITED VIDEO Inc.
P.O. Box 2686,
Tulsa, Oklahoma 74101
(918) 587-1171
An LVO Cable Company

Town Turns Tables: When Does User Bait Vendor?

(Continued from Page 13)

even remotely suggested the school should have a right to cancel the contract. Curiously enough, however, the school wants to go back to IBM.

Could Vendor Sue?

On Aug. 14 the computer advisory board members suddenly discovered that the computer coordinator wants to put in an IBM 360/30 instead of the Honeywell system. [This, incidentally, is the solution I advised months ago]

The system he wants is owned by a leasing company, and is available from a local firm with more than adequate computing capacity for normal loads. The local firm would like access for occasional peak loads.

The terms proposed were $4,750 per month with the local firm continuing to pay for IBM maintenance. (Officially a contract for more than $2,000 is supposed to be obtained by open bidding. However, if it is made out for renting computers for up to five years it counts as services, and is not covered by the regulation.)

When the advisory board was then told of the cancellation, it was also told that Honeywell totally failed to support the system, and the board was asked to approve the substitution.

The person who first raised the whole question on how much computer is needed to train a programmer, Walter Vignault, now questioned to what extent the school is responsible for its own problems by not spelling out properly the support it needed in the contract. The IBM employee on the advisory board demanded that any new procurement be handled under the same rules as the previous ones – namely, open bidding. [The Honeywell member was not present.]

I got involved at this point by being asked to go over both the Honeywell contract and the acquisition of the new system itself – partly because I have been researching bait-and-wait situations recently.

Time is now said to be of the essence. The school was to open Sept. 4. Copies of the cancellation basis and documents and contracts were turned over to me; I was shown the authorizing resolution referring to the proposal, and I prepared a report for the school.

My conclusion was Honeywell's behavior was OK.

But the school has not been living up to the contract. I feel Honeywell could successfully sue the school district for $180,000 (which worries me, because I would have to help pay for it and still leave the school without a computer!)

My first suggestion was that the faster the school and Honeywell got back together, and tried to get a new set of conditions, the better. While this was being typed, I unsuccessfully tried to contract the school authorities.

I did, however, contact the Honeywell regional director, Frank D. Jakubik. He said he had met with the school early in August, and that the cancellation had been formally withdrawn by the school in a letter dated August 8. But the computer advisory board was not told about this – nor was I told when asked to help.

On Aug. 23 the computer coordinator suggested I review the state-of-the-software on Sept. 1, reporting on it to the school committee on the night of Sept. 4 when it would decide whether to accept the "fabulous" offer of the Model 30.

Honeywell, he said, had not been informed; delivery was not scheduled until Sept. 5. Apparently the manufacturer baiting is to continue until the day before delivery!

I do not like manufacturers being baited by users, any better than I like users being baited by manufacturers. But I do not know if Framingham is unusual. It may be. If you know of cases where users have baited computer vendors – please let me know.

© Copyright 1973 Alan Taylor. Reproduction for commercial purposes requires written permission. Limited numbers of copies for non-commercial purposes may be made provided they carry this copyright notice. The views expressed in this column do not necessarily reflect those of *Computerworld*.

More Letters

Jobs Measured With Jobs

We've got a solution to Zaphyr's Aug. 29 complaint about the inability to measure DP power. Further, it is simple enough to not be draped in the esoteric lab coat of a "von Neumann."

Dale Brotherton ["System Analysis from Scratch," CW, June 27] and I have been working with the "job" as the unit of measure. The "job" is that thing which shows up on the customer's bill, so it should be recognized by those in upper management.

On the half dozen systems examined to date, the "job" has held up well; but we'd like to work with more data. We extend an offer to those who might like to donate data. Results would be shared on an anonymous basis.

We need groups of 20 to 30 data points taken from 24 hour periods (or eight hour shifts):

1. Hours the machine was available;
2. number of jobs processed, ignoring spooling (Hasp, Power, etc.) runs; and
3. total elapsed time these jobs were active in the central processor.

Donald C. Harder

Computer EKG
Cleveland, Ohio 44141

A 23rd Subroutine

IBM is my shepherd, I shall not write application programs.
He maketh me never ending releases of OS.
He restoreth my PSW registers.
He guideth me in my RFP specification for His nameplate's sake.
Yea, though I walk through the valley of the shadow of plug-compatible peripherals, I will purchase no other, for thou art solvent, thy marketing force and thy cash reserves, they comfort me.
Thou preparest a Long Term Requirements Study before me, in the presence of mine detractors.
Thou annointest my head with Executive Training sessions, my DP budget runneth over.
Surely, marketing support personnel and systems engineers shall follow me all the days of my life, and I shall dwell attached to the umbilical cord, forever.

Brother Nalla Marzepton

Computerworld welcomes comments from its readers. Preference will be given to letters of 150 words or less. *Computerworld* reserves the right to edit letters for purposes of clarity and brevity. Letters should be addressed to: Editor, Computerworld, 797 Washington St., Newton, Mass. 02160.

A Surprising Comparison

INSCO vs. NCSS

Choosing a timesharing service isn't easy. There are a profusion of suppliers offering a wide range of services at widely varying prices. To help cut through the confusion, we offer this first in a series of comparisons between INSCO: Timesharing and other major services. In addition to the latest published prices available, we also compare commonly accepted criteria for selecting a service.

COST	NCSS*	INSCO	Per Cent Savings
Per CPU Second (256K Machine)	$ .38	$ .27	29%
Connect Time (10, 15, 30 Characters/Second)	$10.00	$8.00	20%
Disk Access (Per 1,000)	$ 1.00	$ .61	39%
Disk Storage (Per month per cylinder where cylinder equals 125,000 characters)	Sliding Rate $20.00-$10.00	Flat Rate $10.00	0-50%

*Based on Published Price List Dated April 16, 1973

Programming Language

INSCO	NCSS
All major programming languages are available, many with proprietory INSCO features.	All major programming languages are available, many with proprietory NCSS features. Many special application languages are also available.

Technical Support

INSCO	NCSS
Complete program development, debugging and checkout services are offered. A 150-man application support staff backs up the technical consultant assigned to your account to help with training, operations and special problems.	Program development, debugging and checkout services are offered. The systems development staff averages seven years' experience in time-sharing systems.

Availability

INSCO	NCSS
Service is available through a nationwide network of 30 centers.	Service is available through a nationwide network of 16 centers.

Reputation

INSCO	NCSS
Sales in 1972 were over $20 million. INSCO's Staff was among the first to provide time-sharing for major commercial applications.	Sales in 1972 were over $16 million. NCSS was the first to make Model 67 available in a successful time-sharing system.

Take advantage of INSCO's surprising capabilities. Call Lee McDermott or write us for complete information.

INSCO Systems Corporation
3501 Route 66
Neptune, New Jersey 07753
Tel: (201) 922-1100

Name & Title
Company
Address
City, State & Zip
Telephone

INSCO

JCL Made Easy?

LOS ANGELES – The problems of JCL creation and control can be minimized for OS/360-370 users through the installation of the JCL Docu-Gen package, now available from Compumail. The system works under both conventional and VS-1 conditions, the company said.

JCL creation is controlled, in the first place, through a preprinted "transmittal form" which provides enough parameters so users can, and must, adequately define the job then being set up for execution.

By fixing the entries being requested, the system helps the installation enforce standards as well as maintain its procedure library.

Maintenance of the JCL is supported by a printout called a JCL Documentation Listing, that shows all pertinent file information for every job that has been set up under JCL Docu-Gen.

The operations staff is also given a report, called the Job Description, which shows all file information needed to set up and run a job. A system flowchart and tape or disk labels are also output by the package, the company said.

The program is written in ANS Cobol and is available for $1,000, which includes some tailoring to user requirements, an object module, implementation instructions and user guide. Delivery schedule varies with the amount of tailoring required.

Compumail is at 1951 Malcolm Ave., 90025.

Waterloo Assembler Runs Faster, Takes More Core Than IBM's 'F'

By Kenneth P. Seidel

Special to Computerworld

WATERLOO, Ontario – OS/360-based installations that do any significant amount of work in Assembler language might do well, if they can afford the main memory, to consider using the Assembler G package from the University of Waterloo.

This assembler was first developed more than three years ago so it has been around long enough to be well proven.

It does, however, require "less than 100K" of core compared to the 44K used by IBM's standard Assembler F.

Installations should, in my view, consider using Assembler G because:

- Performance in assembly of source programs containing many macro-instructions will improve substantially.
- Assembler G is capable of handling larger programs.
- A variety of additional options is provided, while retaining compatibility of object programs.

Analysis

Assembling code heavily laced with macros gives improvements in performance that are dramatic. (The task of performing SYSGEN for IMS, for example, requires many such assemblies).

In particular, for one assembly that established a model 3270 terminal format definition, the number of Disk input-output commands (EXCP) was reduced from nearly 35,000 using Assembler F to just over 200 using Assembler G.

In each run, there were 376 source statements, 895 records read from SYSLIB, and the NOLOAD and NODECK options were in effect.

F Wastes $

Realizing that job cost algorithms use both CPU time and number of disk EXCPs as important factors, one can see that continual use of Assembler F adds up to a lot of wasted dollars at most installations.

Considering the number of years that Assembler F has been in use, one gets an appreciation of the monetary benefits IBM has reaped.

In another dramatic demonstration of the effectiveness of Assembler G, an assembly was initiated through TSO by a standard "ASM" terminal request; 36 minutes later (wall clock time), Assembler F had not finished the job, and the time-sharing session was canceled automatically due to inactivity (pursuant to a local change installed in the operating system).

But when the same source program was fed to Assembler G by a TSO request, the assembly was completed in under four minutes.

The particular user who supplied this source program for comparison looks upon the availability of Waterloo's G-level assembler as a breakthrough, because he can now accomplish much greater amounts of debugging – an activity often delayed in the past by slow reassemblies.

Measurement	F	G
Elapsed time (min)	13	1
CPU time (sec.)	41.21	16.90
Disk I/O EXCPS	34,801	208

Assemblies run in 150K regions showed dramatic differences between IBM's and Waterloo's processors.

The great improvement in performances cited lies in the approach to handling macro-definitions; the G-level product usually holds macro-definitions in main storage, whereas the F-level IBM product always retrieves the definition from a utility work file for each reference.

Much time and money has been wasted over the years through loyal use of the standard Assembler F. Now there is an inexpensive alternative, since Assembler G is available for a one-time charge of $300.

Seidel is an independent DP consultant in Fallbrook, Calif.

The 'Direct' Approach

File Manager Eases Data Access

By Don Leavitt

Of the CW Staff

COLUMBUS, Ohio – The Disk Record Technique (Direct) package has been described by the distributor, Systems Implementation Inc., as a general-purpose direct-access file handler that offers a variety of data management techniques for the 360 user, but without imposing massive storage demands.

Direct should not be compared to IBM's Information Management System (IMS), Honeywell's Integrated Data Storage (IDS), Forte or any similar data base management scheme, the company explained, adding that in general such comprehensive systems are usually too complex for most users anyway.

Requiring no more than 25K storage and space enough on disk for the actual data and keys, Direct handles variable length records and random-record processing.

Batch record processing can be done in either unordered or key sequence, but the user may also work with partial key random retrieval, or any of these techniques – concurrently.

The usual approach to data base management, according to Systems Implementation, is to spend considerable time defining logical and physical file structures in order to have a fairly efficient application system.

Reorganizing the structure or adding linkages in the light of real experience can be very difficult.

Direct, on the other hand, allows the user to store the data and create only the structure or paths needed initially. As new structures or paths are required, they can be made by modifying existing records or adding new ones.

Conceptually, Direct consists of two files or data sets: one assigned to the directory; the other, the data. The directory is always in sequence allowing rapid retrieval sequentially or easy calculation for random access, the firm said.

The records handled by Direct may be any length, although the system logic currently includes a maximum length parameter, largely to avert problems that might arise from an erroneous length entry when defining the file.

Direct has the ability to process multiple streams of data allowing the accessing of sequential, random and unordered record types without program swapping of buffers.

This permits the user to compare and process different record types simultaneously, the company noted.

Direct is written in Cobol and source code is provided so it can be modified easily or integrated directly into a user's program rather than being accessed through a CALL statement.

The package is currently available for $11,500 from 88 E. Broad St., 43215.

Keydata Adds On-line Accounting Systems

WATERTOWN, Mass. – Businesses can gain better control over what they buy and sell by utilizing one or more of four on-line services recently introduced by Keydata Corp.: Open Purchase Orders; Open Orders; Back Orders; and Planning, Analysis and Reporting (PAR).

The on-line Open Purchase Order service has been developed to generate purchase orders as stock is depleted and to provide current information on order status with indications of partial shipments.

Calculation of average lead time for item delivery is also part of the service, the firm said.

Availability of both Open Order and Back Order systems allow the user to continue whichever accounting/billing approach he followed before moving to Keydata.

The Open Order service produces an invoice each time a shipment is made, and all customer accounts receivable records and on-hand inventory levels are adjusted as the invoice is released.

Under Back Order processing an invoice is prepared as goods are shipped, but unshipped items are flagged for whatever treatment the user deems appropriate.

The PAR service allows the executive to measure his company's actual performance against forecasts, and to spot problem areas. As with most forecast-keyed systems, this allows him to develop several budget plans to see the potential impact of each before they are adopted.

The firm is at 108 Water St., 02172.

DO YOU NEED A GOOD MACHINE UTILIZATION AND JOB ACCOUNTING SYSTEM?
COMPUT-A-CHARGE IS IT!

COMPUT-A-CHARGE

SOLVES MULTI-PROGRAMMING BILLING PROBLEMS AUTOMATICALLY.

Comput-A-Charge provides an efficient billing system; allows you to analyze the performance of your computer because it breaks down costs so effectively.

Used with the IBM 360 or 370, it analyzes every job in your system, computes charges for exact CPU time, elapsed time and I/O count, and charges for each class of peripheral device.

What other system can match this performance?

DAILY REPORTS: Summary of jobs . . . idle time . . . multiprogramming graph . . . class utilization . . . device utilization . . . shift analysis.

PERIODIC REPORTS: Device utilization . . . cost feedback . . . job cost utilization . . . application utilization . . . major application graph . . . total system summary.

BILLING: By core used, core requested, CPU, I/O cards read, lines printed.

For more information on how you can maximize the effeciency of your computer with automatic machine utilization and job accounting, just mail this coupon, or call (609) 667-8770.

value computing inc.
496 Kings Highway North
Cherry Hill, New Jersey 08034

GENTLEMEN:
PLEASE SEND INFORMATION ABOUT
☐ COMPUT-A-CHARGE
☐ CALL ME FOR AN APPOINTMENT

NAME ____________ TITLE ________
COMPANY ____________________
ADDRESS ____________________
CITY __________ STATE ______ ZIP ___
TELEPHONE ______________

Kronos Transaction Processing Adds to Options for CDC Users

MINNEAPOLIS – With its announcement of a new version of the Kronos operating system (Kronos 2.1) Control Data Corp. has reiterated its intention to provide even system control software on a separately priced basis, so that the users can pick and choose those features they need, and realize their cost.

CDC has added an optional transaction processing module to Kronos for CDC 6000 Series and Cyber 70 mainframes, and as a result, users now can work in five separate modes concurrently.

Support for local batch, remote batch, interactive time-sharing and deferred batch processing, available in earlier versions of Kronos, are also in the new version. The system has also been enhanced with the availability of a new APL processor for devotees of that interactive language.

In addition to the Kronos Transaction Processing (KTP) module, the operating system has been enhanced with a new resource executive and a new mag tape system, each of which is said to improve the system efficiency. A data management capability has been developed for use with KTP and the batch processing modes.

The new operating system can be installed on the small end of the Cyber 70 line, requiring a minimum main memory of 327,680 characters.

The complete Kronos 2.1 supports Fortran, Cobol and Algol as well as assembler and the new version of APL. The system is said to be able to support as many as 500 separate, active terminals on-line, but the modular growth allows networks to grow from a few terminals to hundreds, without any conversion, a spokesman claimed.

A control language (KCL) allows the user to transfer control and perform arithmetic and test functions. It also provides full procedure file capabilities.

$4,750 to Install

The basic Kronos 2.1, available now, carries an installation charge of $4,750 and a recurring $1,000/mo for maintenance. This package includes the local, remote, time-sharing and deferred batch processing support. KTP is treated as an add-on; there is no installation fee, but CDC does charge $300/mo for its use.

The APL support is available for a startup fee of $500 and $250/mo. Another module, Cyberlink, which allows Cyber 70 or Kronos users to tie directly with other high-speed CPUs, carries a $100/mo charge.

'Symbug' Package Eases VM/370 Cobol Debugging

NEW YORK – Users can interact with Cobol programs executing under the Conversational Monitor System of IBM's Virtual Machine Facility/370 (VM/370), especially to locate and correct errors quickly, with the Cobol Symbolic Debugging (Symbug) package from Standard Data Corp.

The user interaction can occur whenever execution of the Cobol program results in a program interrupt, when a preestablished breakpoint or execution interruption is encountered, or when the user causes an external interrupt.

The Symbug command language has a syntax closely related to Cobol's English-like structure, the vendor said, and includes the facilities needed to set absolute or conditional breakpoints, to clear them or to list them so that test status can be documented.

Once the program is halted at a breakpoint, any of the other Symbug commands can be executed repetitively. Standard CMS commands can also be executed from a Symbug environment, spokesmen for Standard noted.

The command language also allows the user to display, compare or modify the contents of data items; to trace execution of programs, subprograms, paragraphs and line number; and to monitor a variable with control returning to the user whenever the value of the variable changes.

Testing under Symbug may include a delayed activation of a breakpoint so that processing can loop through the inhibited halt any specified number of times before program execution is finally suspended. With the debugging package, users can resume execution of the Cobol program after any breakpoint halt.

The conditional breakpoints allow the system to divert to a predefined set of Symbug commands if certain conditions are met, or to direct user control if they are not met.

Since Symbug includes printout of the Cobol source statements involved in any debugging effort, programmers need have no knowledge of machine language or hexadecimal arithmetic to utilize the software.

Symbug is described as compilation independent and installation is said to take less than a day. The package has a one-time price of $10,000 but lease plans are available.

Standard Data is at 1540 Broadway, 10036.

PC Faults Located Through 'Flash II'

PHOENIX – Engineers with access to in-house IBM 360/370 or Univac 1110 equipment or the GE Mark II time-sharing network can now build test programs to identify faulty components on printed circuit boards, with the Flash II software package from Mirco, Inc.

The package requires a 124K partition, minimum, under DOS or OS/360, can handle 300 integrated circuits on a board, and comes with a library to model more than 400 IC types. The Fortran IV source code is tailored by Mirco for the user, and costs from $50,000 to $200,000, a source said at 2116 W. Peoria Ave., 85029.

IS THE COST OF DOS/CICS TOO HIGH?

MINICOMM IS THE ALTERNATIVE.

The cost of CICS may be higher than you think.

Add up the cost of core, education and program development and you may find, as many of the MINICOMM users have, that an alternative exists which costs less, contains greater flexibility, is easier to use, and provides future growth capability.

MINICOMM requires from 3K to 8K of core depending on terminal configuration. Programs may be written in any IBM 360/370 language and executed in a remote and/or local communication environment.

A version of MINICOMM is also available for the small CPU users. Through a unique core sharing technique, MINICOMM Type I will simulate a DOS multi-programming environment, providing on-line CRT capability without adding core and operating concurrently with batch jobs.

All IBM 2260 and 3270 compatibles are supported in either local and/or remote mode.

Why not find out more by calling Paul Berens 212-489-7200, or fill out the coupon and mail it today.

PROGRAMMING METHODS
1301 Avenue of the Americas, New York, New York 10019

NAME TITLE
COMPANY
ADDRESS
CITY STATE ZIP
PHONE

COMPUTER
PROGRAMMING METHODS A DIVISION OF
GTE INFORMATION SYSTEMS

Model 33ASR with dial-up set and complete maintenance service for $77 per month.

RCA opens up a new line to "Data-Phone*" Teletype** users

Now – lease Teletype equipment from RCA for just $39 per month (send/receive model 33KSR) including maintenance. With dial-up set, only 80¢ a day more!

- Prompt installation and maintenance services by RCA technicians based in over 130 cities.
- Immediate delivery in any quantity from coast-to-coast warehouse network
- Automatic unattended operation
- Built-in dial capability
- Alternate voice communications
- Friction or sprocket (pin) feed
- Interfaces with Bell System 1001B(CBT) and 1001A(CBS) or Western Union TAA for TWX use.

Call or write your local RCA representative about his complete line of data sets, telephone couplers, solid state selectors and multiplexing equipment.

RCA Service Company A Division of RCA

- CAMDEN, N.J. 08101, Bldg. 204-2, Phone: (609) 779-4129
- PHILADELPHIA, PA. 19145, 3310 South 20th Street Phone: (215) HO 7-3300 (Pa.), (609) WO 3-2043 (N.J.)
- ATLANTA, GA. 30318, 1778 Marietta Blvd., N.W., Phone: (404) 355-6110
- CLEVELAND, OHIO 44142, 5121 W. 161st. Street, Phone: (216) 267-2725
- JERSEY CITY, N.J. 07305, Liberty Industrial Park, 43 Edward J. Hart Rd., Phone: (201) 434-0003 (N.J.), (212) 732-9494 (N.Y.)
- SKOKIE, ILL. 60076, 7620 Gross Point Road, Phone: (312) 965-7550
- DALLAS, TEXAS 75207, 2711 Irving Blvd., Phone: (214) ME 1-8770
- MONTEBELLO, CALIF. 90640, 1501 Beach Street, Phone: (213) 685-3069

*Registered service mark of AT&T Co.
**Registered Trademark of Teletype Corp.

RCA

Adherence
to the highest standards of professionalism in the EDP Industry.

LESLIE, KAVANAGH INC.
505 Fifth Avenue, Suite 1300
New York, New York 10017
(212) 661-0670

Specialists in EDP Professional Search

Quantor
COMmon Sense
in
Grocery Inventory

A major grocery chain links up
with Quantor COM
to shelve a competitor system.

Quantor

520 Logue Avenue, Mountain View, California 94040 (415) 965-3700,
Oak Brook (Chicago) (312) 654-3720, New York, N.Y. (212) 279-3280;
Washington, D.C. (703) 960-3707; Los Angeles, Calif. (213) 849-3634,
Miami, Fla. (305) 448-3650; Atlanta, Ga. (404) 237-1176;
Houston, Texas (713) 772-1772; Philadelphia, Pa. (215) 643-2250

COMMUNICATIONS

Data Briefs

Computoll Cobol Package Analyzes Wats Usage

NEW YORK – Computoll Corp. is offering a program in Cobol to help the Wats line user analyze his monthly calling patterns.

Input comes from magnetic tape or punched cards available from the carriers. The company also offers an auditor for more detailed recording of calls.

The printout shows the prorated Wats cost of the call and the call's comparable cost if made on a toll basis. There is a 10-digit listing of all calls with the date and time of day, plus a footing and subtotal for each area code called and each telephone number or exchange receiving 10 or more calls.

The program takes up 64K and is IBM compatible.

It costs $8,000, including maintenance for a year, from the firm at 866 Avenue of the Americas, 10001.

HP Mates With Terminet

PALO ALTO, Calif. – Hewlett-Packard has interfaced the General Electric Terminet 300 terminal printer with HP products.

Called the HP Model 2762A, the unit interfaces HP computers with a plug-in interface card and appropriate software.

The Model 2762A will cost $4,775 for a 75-column console with friction drive platen. A 118-column forms-handling terminal with tractor paper drive and horizontal/vertical tabbing costs $5,775 and a receive-only forms-handling terminal version costs $5,275.

Interface hardware is $750 additional.

More Miles per Modem

ROCKVILLE, Md. – Penril Data Communications, Inc. is offering a four-channel modem contention unit (MCU) that permits a single modem to service up to four terminals located within a few hundred feet of the MCU.

By operating a string of their MCU-4 units in tandem, Penril said, users can extend a single modem to cover 7, 10, 13 or more terminals, saving both modem and line costs.

The MCU-4 costs $490, with delivery in 30 days from 5520 Randolph Road, 20852.

CRT Terminal Does 3740 Work

LOS ANGELES – Car-Mel Electronics Inc. has introduced a desk top CRT that is compatible with IBM 3740 applications.

Called the Informer, the CRT works directly with a minicomputer or can be attached to the remote end of a phone line. Remote usage can be on either private or dial-up lines.

The Informer is priced at $1,950 and is available from stock. The firm is at 2218 Cotner Ave., 90064.

Telecontroller Installed

Front-End CPU Is a Credit for Banks

By Michael Weinstein
Of the CW Staff

CLEVELAND, Ohio – A front-end data communications processor system is much more valuable to the user when it can handle more than communications, as BancSystems Association will attest.

BancSystems runs a large credit card authorization network accepting and responding to inquiries from 180 member banks and thousands of merchants on the status of individual Master Charge accounts.

As inquiries for information kept increasing it became evident the IBM 360/65 needed help.

"We felt by removing the communications function from our host computer, we could save valuable memory" and "extend the life of our host computer," stated Robert C. LaHair, BancSystems President.

As an added capability, LaHair stated he was looking for a front end that handled line communications and also editing and credit authorization as a back-up.

If some solution could not be found, the other major alternative to be considered was to upgrade to an IBM 370/158, LaHair said.

After a "long study of available ancillary hardware," Bancsystems settled upon the Telecontroller processor system from Action Communication Systems, Inc. of Dallas, Texas.

The Telecontroller replaced five IBM 2701's and one 7770 voice response unit. The system presently performs line functions for one 2400 bit/sec. binary synchronous line, six 2400 bit/sec. lines and three 4800 bit/sec. lines.

There are approximately 120 video display terminals multi-dropped on these lines.

In addition to line control, the system acts as back-up for the 360/65. The Telecontroller stores 16-character card holder account records on disk for credit authorization functions.

During host computer downtime, the Telecontroller receives all authorization requests and issues approval or rejection based on a comparison against its own on-line files. All transactions are logged on disk for later recovery by the host computer.

A secondary advantage of the Telecontroller system, according to LaHair, is in giving the overall system a "greater deal of flexibility when it comes to interfacing with various remote terminals within our network."

The $7,000/mo. cost of the Telcontroller system is offset by the fact that it replaced $6,000/mo worth of IBM 2701s and the $6,000/mo paid for the voice response unit, LaHair noted.

Another benefit is releasing a 32K byte partition previously needed within the host computer's main memory to control accessing, he added.

But most importantly, moving to the front-end system has saved 20% of the central processor time, previously used to control line functions.

Put in terms of dollars, according to LaHair, this 20% "allowed us to keep our Model 65" and thus represents the difference between the cost of a 360/65 and a 370/158.

Bunker-Ramo Unveils Store/Forward System For Stock Brokers

By Patrick Ward
Of the CW Staff

TRUMBULL, Conn. – Bunker Ramo has announced a turnkey store-and-forward communications switching system for small-to-medium size brokerage firms.

Called CCS (Central Communications Switcher), the system is designed to automate and speed up communications between main and branch offices, exchanges, correspondents and other locations, replacing telephone and slow-speed teletypewriter operations.

It will handle all types of brokerage message traffic, including buy and sell orders, execution reports, customer account data, cash and security movements, broadcast messages, confirmations and management reports, according to the firm.

The CCS system software includes line control and polling, switching, queueing, logging, alternate and duplicate routing, sequence number checking, error detection with automatic retransmission and traffic systems reporting, the firm said.

Four Circuits

Line capacity is four 2,400 to 4,800 bit/sec full-duplex multidrop private circuits, plus six low-speed multidrop circuits for teletypewriter terminals.

The low speed communications line disciple and standard formats meet N.Y. Stock Exchange requirements.

CCS hardware at the central site consists of a communications processor, a tape cassette unit, a message log printer and a supervisory CRT/printer console.

Remote locations use a CRT terminal and a printer connected to the central site through a multifunction programmable control unit which can switch a terminal to either communications or quotation and ticker tape use.

The central site equipment leases for $735/mo, with delivery in 12 months from 35 Nutmeg Drive, 06609.

Canadian Paper Recommends Liberalized Network Access

By Ronald A. Frank
Of the CW Staff

OTTAWA, Canada – The Canadian government has issued a position paper stressing the importance of computer/communications and urging cooperation with provincial governments in this area.

Urging the expansion of current technology, the paper said: "If computer-service firms and other users were given greater freedom in the technical use of carrier facilities, as well as in the attachment of independently supplied equipment to the public networks, there could be significant savings for users, and better utilization of the facilities."

But such a move should not "adversely affect" the economies of scale and rates of the regulated public utilities, the paper added.

The government said "data communications are a primary vehicle for achieving . . . the widespread availability of computer-based services."

The government policy should require "any supplier of remote computer services to the public be permitted access . . . to the data transmission facilities of the federally-regulated carriers, subject to appropriate conditions and charges but with greater freedom than is now generally granted by the carriers . . . "

The government favors a relaxation of present rules under which users are given access to carrier transmission facilities provided that these users and computer-service firms conform to technical and operating standards.

Under these conditions, "computer-service firms and users might be permitted [to use] their own equipment, if desired," the paper said. This in turn would allow more efficient use of facilities by the concentrating and multiplexing of signals, it added.

Such an environment would include the attachment of remote data terminals to the public switched networks (with proper regulatory approval) and the sharing of data transmission facilities.

Recognizing the importance of computer/communications, regional and nationwide networks will be encouraged, the report said. Included would be multidisciplinary research at universities and related institutions.

The paper was issued "not as a firm statement of settled government policy, but in order to provide a positive basis for discussion with provincial governments and others."

World's First 1200 Baud
Full Duplex
Two Wire Modem

vadic

505 East Middlefield Road,
Mountain View, Calif. 94040
(415) 965-1620
TWX 910-379-6567

Dear Ma:
Remember when you took me to see the magician that sawed the lady in half? Vadic has just done the same thing to line costs!
Believe it or not, they have a modem capable of full duplex data transmission at 1200 bits per second over dial-up or two-wire leased lines.
Think of the impact this will have on users of CRT's, cassettes, and all sorts of buffered terminals who have been forced to piddle along at 300 bits per second or live with half duplex 1200 bits per second operation.
This modem is really something, Ma. It provides four times the data rate of your 103 while maintaining the same line discipline for connect, hand shaking, and disconnect. Imagine eliminating the complicated and inefficient half duplex mess forever. The zero turn around delay will save bundles on line costs.
I hate to tell you, Ma, but the VA3400 can be used in Vadic's Multiple Data Set or standalone units which have analog and digital loopback, display of all EIA interface signals, built-in 300 and 1200 baud test signals. It can also be used with any of Vadic's automatic dialers.
The price? Better sit down, Ma. Just $750, with OEM discounts available.
Delivery is 60 days ARO. Better phone your order in soon.

Your independent thinking son,
Alexander Graham Jr.

P.S. Who's Vadic? They've delivered over 20,000 modems to date.

VADIC: Bell & IBM type modem modules, modem modules on PC boards,
16 channel multiple data set systems, 4 channel stand-alone data set,
1 & 2 channel stand-alone, analytic test panels, modem/dialer combinations.

Ma Bell
195 Broadway
New York, NY 10007

Memorex shatters the barrier on disc pack guarantees.

Not 90 days. Not 1 year. Not 5 years.
A *lifetime* guarantee on Mark X/L disc packs.

The Mark X/L disc pack has been evaluated at customer DP centers around the world. Enthusiastic reports from users have encouraged Memorex to offer an industry-leading warranty. A life-time warranty.

The Mark X/L is Memorex's third generation disc pack which is compatible with the Memorex 3670, IBM 3330 and equivalent disc drives. It is produced under strict manufacturing standards that far exceed industry standards.

These standards have led us to produce the Mark X/L, the finest disc pack in the industry. And the life-time guarantee is our commitment to stand behind the Mark X/L in the most meaningful way possible. For more details, see your Memorex representative.

MARK X/L

Memorex Corporation warrants the Mark X/L Disc Pack to be free of all defects in workmanship and material for the life of the product.

Any Mark X/L Disc Pack which is suspected of a defect in workmanship or material may be returned by the purchaser to Memorex prepaid, properly identified and packaged. If upon inspection, Memorex determines that the pack failure was the result of a defect in material or workmanship, the Mark X/L will be repaired or replaced at no charge. If it is ascertained that the defect was the result of improper handling or storage, transportation in unauthorized shipping containers, malfunctioning disc drives, normal wear or other than a manufacturing responsibility, the defective pack will be repaired at a price governed by Memorex's current schedule of repair charges. The customer will be invoiced for such charges and the disc pack returned freight collect.

This warranty pertains only to the original buyer and is not transferable. When leased Mark X/L disc packs are subsequently purchased, the effective warranty period commences on the date the pack was shipped to the lessee.

The liability of Memorex Corporation under this warranty is limited solely to replacing, repairing or issuing credit, at its discretion, for the products that are defective and in no event shall Memorex Corporation be liable for any other damages, including incidental and consequential damages. The warranty expressed herein is in lieu of all other warranties, express or implied, and no other affirmation of fact or promise made by Memorex by word or action shall constitute a warranty.

MEMOREX

MEMOREX CORPORATION M/S 0064
1125 MEMOREX DRIVE
SANTA CLARA, CA 95052

GTE Adds Terminal And File Support To Intercomm VI

STAMFORD, Conn. – The Programming Methods Division of GTE has an upgraded version of its Intercomm communications monitor software package.

Included in the new version VI are complete OS Isam and automatic recovery and Bdam files. In addition, the software can support an expanded equipment mix including Model 33 and 35 TTYs, IBM 3735, the 1030 Badge Reader, 7770 voice response and Bell 83B3 service.

In addition to supporting data base and communications applications, a multi-threaded interface providing coordinated restart recovery is available for Adabas, Total and DL/1.

Response Increases Reported

Test sites of Intercomm VI have reported response increases over earlier versions of "nearly 50%," according to the company. CPU requirements have also significantly lessened, the firm claimed.

The package supports CPU-to-CPU transmissions for 360/370 users and an enhanced resource manager is said to reduce operating system overhead while providing increased control. Application program modules can be resident, dynamically loaded in planned overlay groups, or used in virtual execution groups with optional temporary page fixing for VS users.

Free, Except...

The new enhancements are free to existing users. One exception is a "major enhancements retainer" of $100/mo for the OS file recovery, multi-threaded interface and data base management support features.

The package is available on a 48-month full payout lease for $800/mo or $32,000 purchase. Four system utilities cost $200/mo or $8,000. GTE is at One Stamford Forum, 06904.

GML Display Review Comes in Four Volumes

LEXINGTON, Mass. – GML Corp. is offering its 2,000-page "Computer Display Review" as a reference set on computer-driven displays.

The four-volume set sold to first-time subscribers contains sections on computer display fundamentals, applications and descriptions and analyses of various manufacturers' alphanumeric and graphic display terminals. There are also sections on microfilm and hard-copy equipment and other display-related products.

The "Computer Display Review" costs new subscribers $450 for the four-volume set and two additional supplements appearing this year. The subscriber then receives additional supplements every four months at a $175 annual renewal rate.

Delivery is two to three weeks from 594 Marrett Road, 02173.

CSMA Communications Week To Be Held in St. Louis

WILMINGTON, Del. – The Communications Systems Management Association will hold its annual National Communications Week in St. Louis from February 19-22, 1974.

Called Gateway to Communications, the conference will include seminars dealing with communications systems management, the implementation of interconnection and the impact of the new common carriers.

Panels will also be held on the role of a communications consultant, university educational programs, the regulatory process and professional publications and how these affect the user.

Further information is available from CSMA at Suite 1003, 1102 West St., 19801.

Port Module Debuts

STAMFORD, Conn. – Data Products has introduced a port sharing module to allow users to combine several terminals, modems or CPUs on the same line.

The module acts as a priority or queuing device and can switch a line under control of the proper EIA interface signals. Called the Model AU-PSU, the device accepts signals from two communications channels or modules and automatically or manually connects all signal ports from one incoming channel to a computer port.

The module comes in versions that connect to 8 or 16 pins on a typical EIA interface. An 8-pin module that could switch two TTYs or other devices costs $130. An enclosure for a stand-alone unit costs an additional $50.

Pin assignments in the module are flexible and can be altered by the user depending on the applications, a spokesman said. Delivery is 60 days from 17 Amelia Place, 06902.

Sanders 8000 Series Terminals Include Cassette, Cluster Units

By Patrick Ward
Of the CW Staff

NASHUA, N.H. – Sanders Data Systems has introduced a series of intelligent terminals that emphasize reformatting ease and minimum interaction with a mainframe.

The 8000 Series includes two stand-alone systems with cassette tape – the 8040 and the 8041 – which transmit in Ebcdic and Ascii respectively. The clustered 8100 uses a disk and transmits in Ebcdic. All the terminals use IBM 2780 and 2770 line desciplines.

The three terminals have off-line data capture to their tapes or disk, dynamic recall and remote batch communication.

Through the series software, users can document source data, such as a premium or sales order, and an operator can simply fill in the blanks, a Sanders spokesman said.

Format changes can be made by unskilled operators – "they don't have to be a programmer," he added.

The 8000 systems permit the creation of formats and pre-definition of data fields at the terminal. Formats resembling existing source documents can be devised on the CRT screens, the firm said.

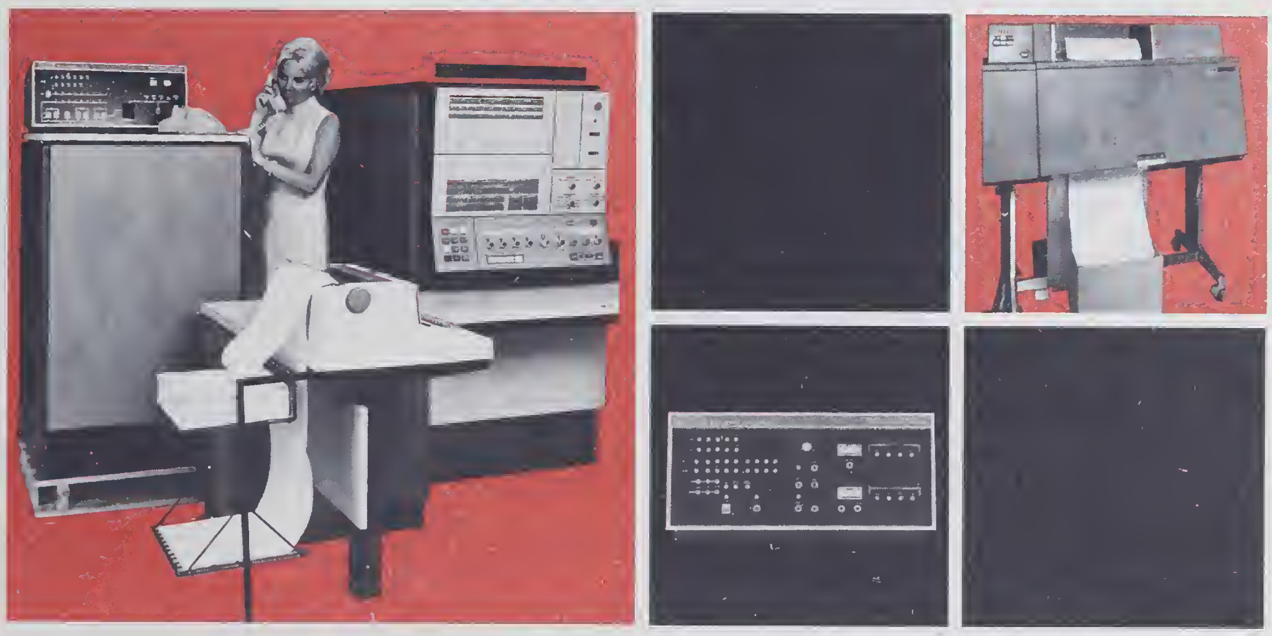
A variety of keyboard editing features enable operators to enter, recall, visually verify and correct data prior to transmission.

Keyboard editing controls include automatic duplication, automatic skipping, left fill, check digit verification, zero balance, batch total, multiply extension, must fill, forward tab, field forward space and backspace, home, clear, field erase, record recall and batch control functions.

The 8040 and 8041 systems both lease for $300 to $320/mo depending on the agreement. Purchase price is $12,800.

The 8100 leases for $735 to $775/mo with a purchase price of $31,000.

Delivery is 30 to 60 days from the firm at Daniel Webster Highway South, 03060.



Attention: DOS Users With 1 to 8 Remote Locations.

The Paradyne PIX is the perfect RJE System for you!

PIX offers you the capability to do remote processing via standard IBM peripherals, *using standard local software*. No expensive front ends, no modems, no increase in core, no system upgrade, no lengthy reprogramming effort, no new and complex programming disciplines. Just a simple, straightforward way to handle your remote processing requirements.

PIX gives you *true* full duplex transmission, the *highest* speed dial-up transmission, *and* data compression – all providing INCREASED SYSTEM THROUGHPUT and AMAZING COST SAVINGS!

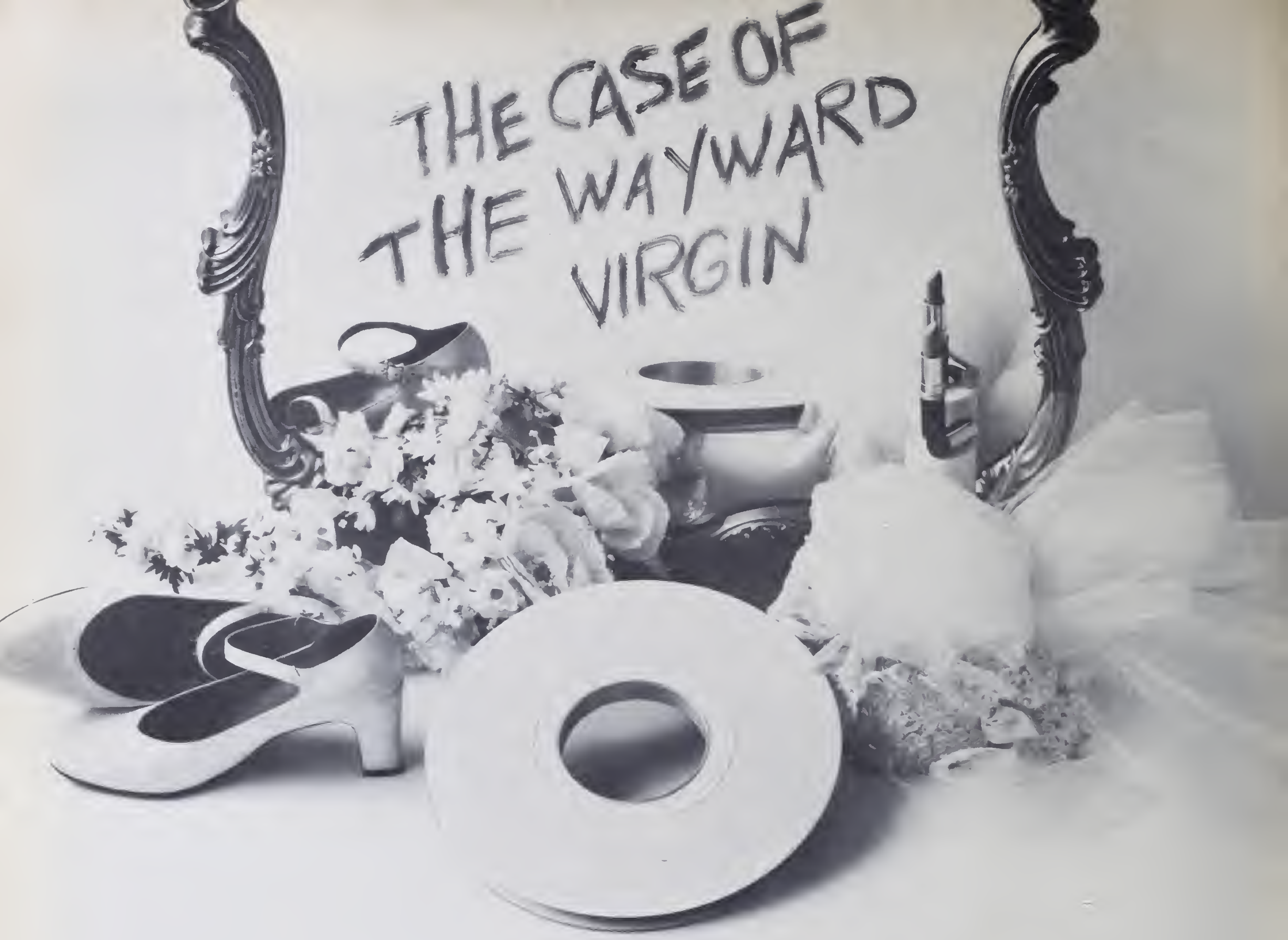
And one more big plus – direct factory service support from 16 strategic locations across the country, every one with direct access to Paradyne's unique Computerized Diagnostic Center.

Want to know what we can do for *your* remote applications? Please call or write:

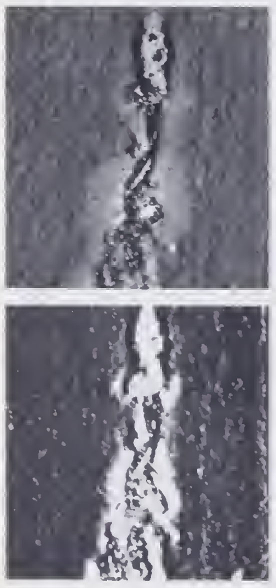
paradyne

Corporate Headquarters: Paradyne Corporation, 8550 Ulmerton Road, Largo, Florida 33540 (813) 536-4771

Marketing Offices Located In: Akron, Atlanta, Boston, Chicago, Detroit, Largo, Los Angeles, New York, Newark, Philadelphia, Pittsburgh, St. Louis, San Antonio, San Francisco and Washington, D.C.



...Or, "error-free" doesn't necessarily mean nobody's fooled around with your tape.



In the computer tape business, they sometimes keep important little secrets from you. For example, tape that's supposed to be virgin (certified as "error-free" at time of certification) doesn't necessarily mean its never been touched. This is shown at left. Tape in top picture has been scraped or "doctored" so serious imperfection passes undetected by the certifier. But repaired error (bottom picture) is now detectable after 100 passes on tape drive.

Wabash, we are proud to say, offers you Quadronix I—**the industry's first certified write-skip free computer tape.**

Wabash has developed a manufacturing process so sophisticated that we can electronically map, diagnose, and correct imperfections in the manufacturing process itself—**before certification.**

Quadronix I is virgin tape, unrepaired because it needs no repairs. If you've heard differently, hear this. **Quadronix I is certified for life.**

We can't answer for the "little white lies" other tapes may tell you, but we can promise you one thing. The integrity of our tape is above reproach.

Let's hear the whole story of the wayward virgin
And Quadronix I-the industry's first truly virgin computer tape.

Name
Title Phone number
Company
Address
City State Zip

wabash

Wabash Tape Corporation, Huntley, Illinois 60142. A subsidiary of Wabash Magnetics, Inc. (312) 669-5181 Teletype 910-651-1800

Bits & Pieces

PDP-8 Users Can Add Tally 2100 or 2200 Line Printers

FARMINGTON, Conn. – PDP8E/M minicomputer users can obtain an interface from Search Systems Development for a Tally 2100 or 2200 line printer.

Printer speed is 100 or 200 lines across 132 columns using a standard Ascii 64-character set.

Price for the interface and connecting cable is $650 from the firm at Farmington Industrial Park, 06032.

Nine-Column Printer Costs $495

SANTA ANA, Calif. – A nine-column digital printer offers users the following features: expansion to 18 columns; programmable two-color printing; rotating drum print mechanism; fixed or floating point; standard adding machine paper; and a last line visible without advancing paper.

The cost for the standard nine-column unit is $495. An increase to 18 columns costs $215, from Newport Laboratories, Inc., 630 E. Young St., 92705.

Old Tape Good on '6,250' Drives

SANTA CLARA, Calif. – Users with Quantum/L or MRX 3 tape reels will not need new tape for use with the higher density 6,250 bit/in. tape drives, according to a Memorex spokesman.

Current Memorex tapes "will perform on 6,250 bit/in. systems as well as on 1,600 bit/in. systems," he said.

PDP-11 Can Have 2M-Word Disk

SANTA MONICA, Calif. – A plug-compatible disk memory with storage capacities from 65K to 2M words for the PDP-11 has been announced by Engineering Data Peripherals Corp.

The memory system consists of a fixed-head per track disk drive, a formatter and an I/O controller. The functions provided by the formatter are disk addressing, error detection and data formatting (parallel to serial and serial to parallel). Individual selection and operation of up to four disk drives is provided by the formatter.

The controller presents a transparent interface to the PDP-11 and serves as the interpreter between the formatter and the I/O bus.

The 256K-word system costs $8,845 while the 512 system costs $10,895 from the firm at 1701 Colorado Ave., 90404.

Iomec Doubles Disk Capacity

SANTA CLARA, Calif. – Iomec has started deliveries of their new Series 3000 minicomputer cartridge disk drives with a 200 track/in. recording capacity.

The 200 track/in. capacity is designed to double the storage capacity of standard 100 track/in. drives from 48M to 96M bits, using four disk surfaces, a spokesman said.

User Tells Experiences

Route Schedule Saves Men, Buses

By William Messmaker

Special to Computerworld

LYNWOOD, Ill. – Transporting 21,000 youngsters every morning to 73 different school destinations, delivering them to their schools on time, but not too early, then returning them promptly in the afternoon to their neighborhood loading points poses a tremendously complex logistical problem at Kickert School Bus Line, Inc.

This year Kickert turned to a computer to create a full bus route schedule. The net result: maximum utilization of vehicles and drivers, minimum unproductive trip time, improved service to students and schools.

With the computer-produced route schedule, Kickert now uses five fewer buses and drivers, which represents an immediate 4% reduction in daily equipment and manpower requirements. In addition, the computer slashed the time required to develop the route schedule from months to hours.

The IBM System/3 Model 6 is also processing company payrolls, accounts receivables and a vehicle preventive maintenance program. But the big payout is expected from route scheduling efficiency, and from the computer's ability to quickly evaluate the effects of a route schedule change, or to simulate alternative route structures and performance results in the event of altered service requirements.

Several geographic, demographic and operating factors complicate the route scheduling problem.

The Cook County, Ill., communities in which the company operates range from rural to suburban to urban, and are quite diverse in child population density and growth rates, ethnic and racial makeup. The public and parochial elementary and secondary schools served are scattered in a 280-square-mile area, have varying starting and dismissal times; some have staggered class hours and others have split-day sessions.

Even with long experienced, highly skilled people, schedule development via the old manual method used to demand at least two months of intensive, full-time effort.

The new system produces a detailed trip schedule for each of the 850 daily routes in only six hours. The schedule meets all school time constraints, while reducing unproductive time for each route trip and assuring the best utilization of the 141 bus fleet.

And it is versatile enough to consider variables of weather and road conditions, driver specifications and bus size – 62-passenger or 76-passenger capacity.

In developing the primary input data into the scheduling program, company personnel carefully plotted on a grid map the precise location of each of the 73 school facilities served. The grid location of the first stop on each of the morning delivery routes and the last stop on each of the afternoon return routes were similarly plotted.

The identifying number of each school, the school name and the grid coordinates of the school location are a key part of the disk record. So are the grid coordinates and the actual street intersection identifications of each of the first or last route stops.

Other vital record segments include the starting time for each school, and the starting time for each route; the dismissal time for each school and the finish time for each route; the arrival and departure variance time (no earlier than, no later than) for each school; the total distance and driving time for each route, incorporating variances in road speed restrictions and weather conditions, construction obstacles, etc. and allowable variances in bus size and ethnic or racial driver requirements.

The computer assays the total transportation task school-by-school, and route-by-route, reviews all route options and combinations, considers all time, driver and vehicle constraints, then sets up route trip schedules to move the maximum number of students with the minimum number of buses in the shortest possible travel time with the least amount of unproductive time for each vehicle and each driver.

The key output is the schedule itself – a "Trip List." This details all delivery (am) and return (pm) trips by route sequence within trip sequence. It identifies the driver and the school, shows the school number and route number, the grid locations of the first stop and the last stop on the route, the starting time, the finish time, and the unproductive time, which includes travel time to the route starting point, waiting time and interroute travel times.

In addition to the key "Trip List," the computer scheduling program outputs a set of "Route Lists" – one for school arrival routes and one for school departure routes.

These list, in numerical school and route number sequence, the schools and the routes serving each school.

Messmaker is president of Kickert School Bus Line, Inc.

ROM Block Gives HP Calculator Batch Processing Capability

PALO ALTO, Calif. – Batch processing capability has been announced for the Hewlett-Packard Model 9830A desktop calculator.

For $485, users can obtain a read-only memory (ROM) block that plugs directly into the calculator and permits programs to be stacked and executed consecutively without further instructions from the keyboard.

The Model 11278B Basic ROM can be used in either a card or batch mode.

In card mode it is used with the HP Calculator Card Reader to interpret specially designed educational Basic Cards.

In a typical application, an entire class studying computer programming could prepare program and data cards at their desks without tying up the calculator. Their programs could then be entered and run in batch.

In batch mode, the calculator will process data and program statements from Ascii input peripheral devices. In this manner, a peripheral device enters a program and data, and the calculator executes that program. Then the program device enters the next program automatically without instructions from the calculator keyboard.

The HP Model 11278B Batch Basic ROM is available from stock from the firm at 1501 Page Mill Road, 94304.

Varian 73 Users Offered 8 Times More Memory With Map Option

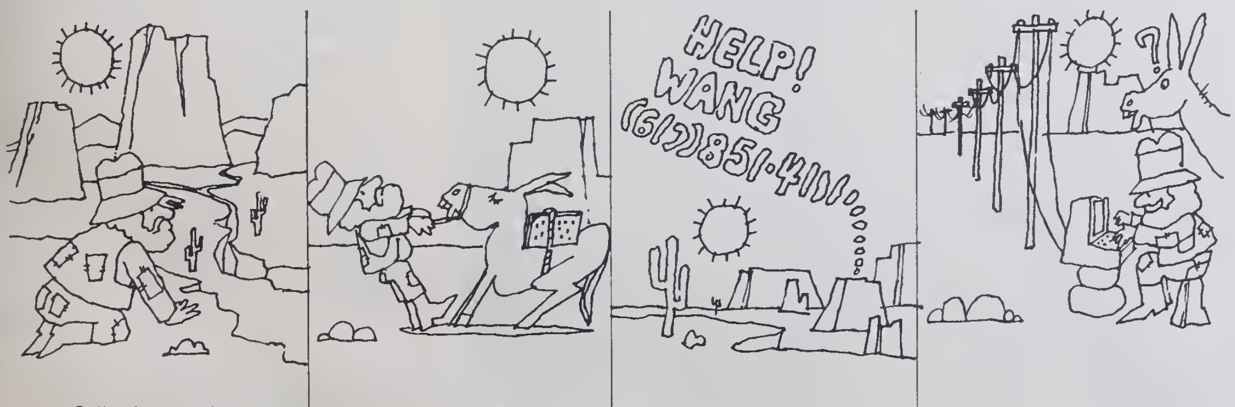
IRVINE, Calif. – A new Memory Map option can permit Varian 73 users to configure their central processor with eight times the main memory previously allowed.

The Varian-supplied option allows main memory to be expanded to 256K words – the previous limit was 32K words.

The memory map is a hardware-implemented lookup table that identifies the physical locations of up to 512 pages representing up to 16 memory-resident programs.

Physically, it is a 1K-word (12-bit word) high-speed random-access memory using bipolar read/write elements. Full cycle time of the Varian 73 processor with memory map option is between 420 nsec and 440 nsec – depending on the size of memory installed.

Price for the option is $5,000 from the firm at 2722 Michelson Dr., 92664.



Collecting data from many locations?

Is your data taking the slow route?

Call Wang's full service Data Center.

For a fast online solution to your data collection problems.

"At Wang, full service is our product"

Tell me more about your FULL SERVICE Data Center:
☐ Online Data Collection
☐ RJE and Conversational Batch Processing
☐ Machine Time
☐ Business Applications: Payroll, A/R, A/P. . .
Name__________
Position__________
Company__________
Address__________
City_____ State_____ Zip_____
Telephone__________
Mail today to J. Keith Lehto or call (617) 851-4111.

WANG COMPUTER SERVICES
(formerly phi Computer Services)
A Division of Wang Laboratories, Inc
836 North Street, Tewksbury, Massachusetts 01876 (617) 851 4111

Gas for Fire Protection

Holiday Inns Has 'Special' Insurance

By Michael Weinstein
Of the CW Staff

MEMPHIS, Tenn. – A fire in Holiday Inn's data processing facility could cost $11.5 million. Holiday Inns has no outside fire insurance, so Alvis Dowell takes his fire prevention systems seriously.

As the firm's safety and loss prevention director, he had Walter Kidde & Co. design a special system employing an odorless, colorless, non-conductive gas superior to other standard firefighting agents, according to Dowell.

The classic name of the gas is bromotriflouromethane, but Kidde calls it Halon 1301.

'Least Toxic'

Although not as well known as other agents in the industrial field, such as carbon dioxide, a Halon spokesman said "it is three times more effective, and, while remaining undecomposed, it is the least toxic of any agent in present use."

Nine 130-lb (charge to 600 lb/sq in.) cylinders of the extinguishing agent protect Holiday's 75-ft diameter 12-ft-high computer room. The tanks are manifolded together and discharge through three-inch pipe to 16 nozzles located either below the floor or above a suspended ceiling. The specified 6% concentration of vaporized extinguishing agent is reached in less than 20 seconds.

Ten ionization chambers for detection of a fire are located in the computer room. Six are located below the floor and four on the ceiling. These are triggered by heat, fire or smoke.

When a fire is detected, an audible alarm and a rotary light beacon are activated, and air-handling equipment, such as air conditioning and heating, is automatically shut off.

A time delay, adjustable up to 90 seconds between the moment of the detection and the actuation of the Halon 1301, gives employees a chance to locate the fire and determine if it can be put out manually.

If the fire is controllable, an abort switch shuts off the automatic system. To control a small fire, portable fire extinguishers are kept near, Dowell said.

Two IBM 360/40s are at the center of $3.5 million of computer equipment installed in a specially built $500,000 annex.

One central processor is on-line 24 hours a day, while the other serves for standard data processing and standby.

The primary processor is linked to approximately 1,250 motor inns throughout the country and handles 128,000 transactions on a typical day, about 100,000 of them regarding room reservations.

RBT

In the good old days, it was RFD. Today, it's RBT . . . the INCOTERM® SPD® 900 Remote Batch Terminal Systems. They deliver.

And because of INCOTERM "push-button" compatibility, what you receive is a bundle of unsurpassed user options. You can mix and match . . . with batch . . . and interactive. Select 2780, 3780, and 2740, 360/20 and 2265, 1004 and Uniscope 100, 200 User Terminal and Series 710. You can interface with your CPU, with your service bureau . . . or with a combination of multiple CPU's or service bureaus.

You get card reading at 150 or 300 cpm and printing at 200 or 400 lpm. And if you want a lot of storage for programs, formats, or data, choose the INCOTERM SPD Diskette. You get up to 500,000 bytes.

But the SPD 900 is far more than just a remote batch terminal. Use it for order entry, remote job entry, file inquiry, and a host of other applications. It all adds up to true multi-function capability.

There are many models available. One of them can deliver for you.

®INCOTERM CORPORATION

6 Strathmore Road • Natick, Massachusetts 01760 • (617) 655-6100

INCOTERM Sales Offices: Boston (617) 655-6100 • New York (212) 541-5780 • Washington, D.C. (703) 524-8610 • Atlanta (404) 289-4230 • Chicago (312) 593-2230 • Dallas (214) 634-2600 • Los Angeles (213) 640-0328 • San Francisco (415) 697-3643

New OEM Products

(While equipment in this column is primarily for Original Equipment Manufacturers (OEMs), in most cases it is also available in single units to interested users.

Further, while much of this equipment is not presently available as such to the end user, it does give some indication of techniques and products that may be incorporated into end-user equipment.)

Disk Rotational Speed Allows Faster Accessing

SUNNYVALE, Calif. – Data Disk is offering a new head per track disk memory system with an average access time of 8.4 msec.

The faster access time of the new 7230Z series – compared with the firm's older 7200 series – has been achieved by increasing the rotational speed to 3,600 rpm – compared with 1,800 rpm previously.

Data capacity is selectable in five increments between 560K and 8.96M unformatted bits. Maximum data rate is 4.2M bit/sec.

OEM prices begin at about $5,000 from the firm at 686 W. Maude Ave., 94086.

A Disk for All Minis

HAWTHORNE, Calif. – The Caelus Model 206 is an OEM 200 track/in. front-loading disk drive designed to interface with "all commonly used" minicomputers.

The disk drive is configured either with one removable cartridge for a storage capacity of 48M bits, or one fixed plus one removable cartridge for 96M bits of data capacity. Total system capacity can reach 384M bits by daisy-chaining up to four drives.

Access time is 9 msec (track-to-track) and 35msec (average access).

Price is approximately $3,800 in OEM quantities from Caelus Memories, Inc., 12621 Chadron Ave., 90250.

Optical Readers Handle Tabulating

NORRISTOWN, Pa. – A family of optical mark sense card readers from Peripheral Dynamics, Inc. is directed primarily at OEM system builders.

The M Series features self-contained units capable of reading either marks or holes in standard 40- or 80-column tabulating cards.

The optical card readers can read pencil marks or punched holes, alone or in combination at speeds of 300-, 500- and 600 card/min.

Data timing can be accomplished with or without timing tracks. Input/output hoppers are available in 500- and 1,000-card capacities.

Prices of the new series start at $1,515 in OEM quantities from 1030 W. Germantown Pike, 19401.

Cassette Drive Keeps Costs Down

SUNNYVALE, Calif. – Dicom Industries has announced the Model 172 Digital Cassette Tape Drive as an OEM product for low-cost digital storage systems.

The 172 offers read/write speeds to 20 in./sec, search and block read/write speeds to 40 in./sec, and fast wind speeds to 120 in./sec. All three speeds have a forward/reverse capability.

Price of the 172 Cassette Tape Drive (includes main deck assembly with cassette loader, single track read/write head, single channel preamp and interconnect P/C card) in 500-unit quantities is $285 each.

Price of the 172 Cassette Tape module (includes the above tape drive as well as reel and capstan servo amplifiers, single channel read/write electronics and digitized interface) in 500-unit quantities is $555 each, from 715 N. Pastoria Ave., 94086.

Keyed to Quality Control

COM Form Slide Kits Cost $200 to $600

WEBSTER, N.Y. – Computer output microfilm (COM) users can get a head start toward optimum operation with a set of seven image control and standard format slides, according to the developer, Photographic Sciences Corp.

Slides come in kits consisting of seven form slides including Resolution Test, Screen Tint Test, Line Width and Type Style Test, Standard Grid Scale, Standard Border, Standard Line and Standard Screen Tint.

The first three slides are designed to allow the highest possible quality control while the latter four provide the user with basic standard startup formats.

The Resolution Test is used to check the focus setting. It indicates when images are out of focus in devices where the focus is set at the factory. In units with a variable focus, this slide allows the user to test the image product at different focus settings.

The Screen Tint Test measures the exposure level of the flash used to take a picture of the image. It allows the user to determine when the light level has slipped to an unacceptable level within the COM mainframe.

The Line Width and Type Style Test has different size type and differing length lines to indicate an optimum type size and a minimum readable type size. It can be used to show user departments the best formats for microfilm reports.

Lines Up Data

The Standard Grid Slide reproduces a 132 by 64 character, print position matrix with each column and row numbcred. It is used to determine alignment of data on slides so that form image is positioned properly.

The Standard Border Slide contains a border line around the 132 by 64 character matrix to define the frame limits.

The Standard Line Slide has a horizontal line every third print line and a border (132 by 64 character matrix).

Standard Tint Slide contains a shaded band every three print lines to assist the user in following data across a frame.

Cost of the kits ranges between $200 and $600, depending on the user's COM device.

The firm is at 23 W. Main St., 14580.

Sideways

The Sidewinder PR 1011 message printer prints 80-column, 16-line messages at an effective throughput rate of greater than 100 char./sec. The lines of 5 by 7 dot matrix characters are printed lengthwise along the 2-3/4 in. paper with all lines in the message printed in parallel left to right. Price for the unit is $389, from Elec-Trol, Inc., 26477 N. Golden Valley Rd., Saugus, Calif. 91350..

The new source
for professionalism and results in executive search and consulting in the EDP profession.

LESLIE, KAVANAGH INC.
505 Fifth Avenue, Suite 1300
New York, New York 10017
(212) 661-0670

Specialists in EDP Professional Search

VOLUME KEY PUNCHING
(402) 346-0330

"JUST MINUTES AWAY"

AMERICANA KEY PUNCH
Redick Tower
Omaha, Nebraska 68102

Bell System Dataphone® 4800 Service cuts your costs 4 ways.

The Bell System's Dataphone 4800 Service for private-line networks is designed to transmit data at 4800 b.p.s.—economically.

First, the charge for the service itself is low.

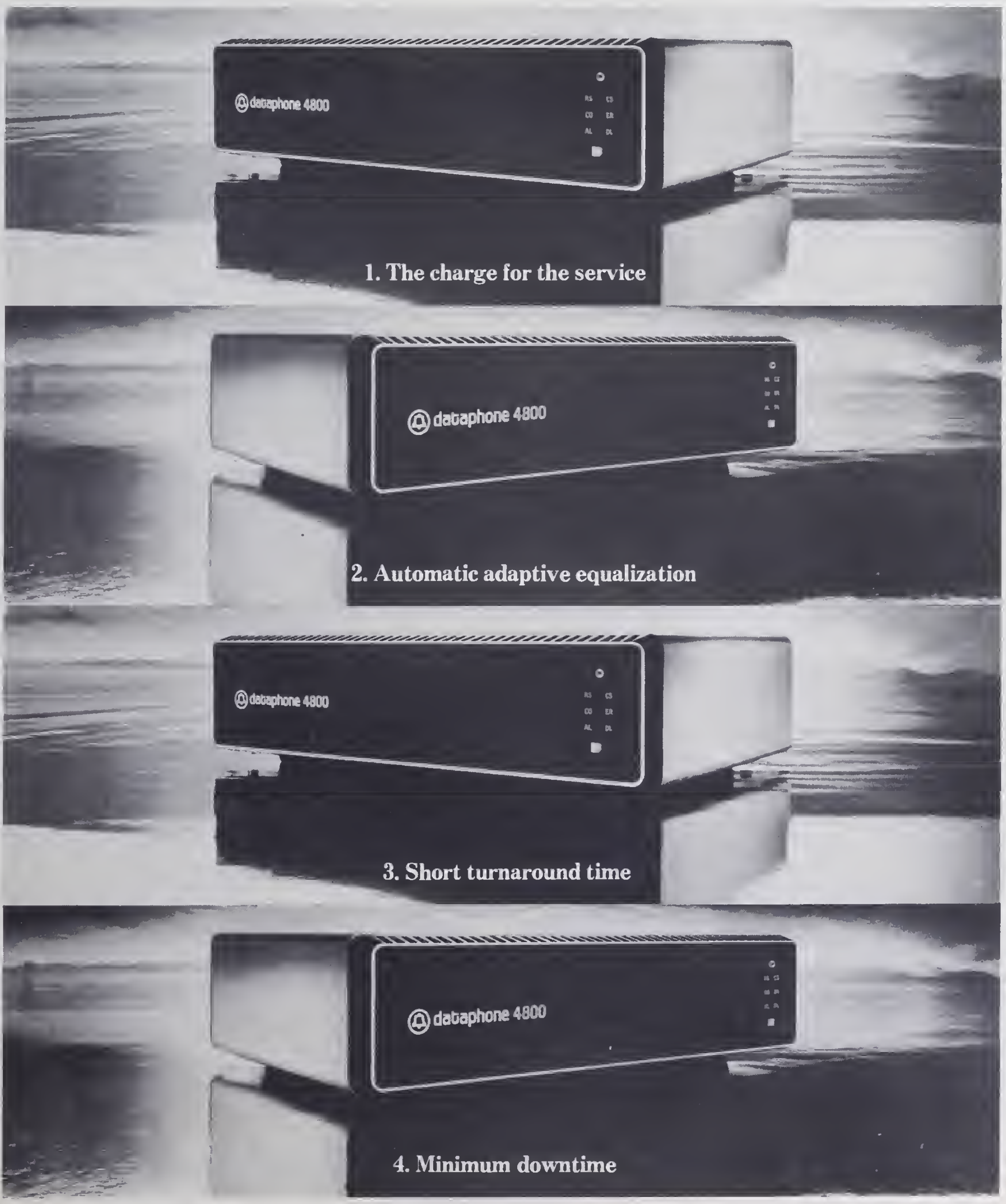
Second, an automatic adaptive equalization feature eliminates the expense of conditioning your private-line facilities.

Third, turnaround time is short—50 milliseconds.

Fourth, in addition to our local maintenance forces, the Bell System's Data Technical Support Team stands behind all our Dataphone service. The Team's collective expertise analyzes and corrects malfunctions quickly, and minimizes your cost of downtime.

At AT&T and your Bell Company, we know you want good data service at moderate cost.

We hear you.



Recurring Computer Nightmare #2

The day the baby whale arrived at the Aquarium.

Maybe it was the office party the night before, or some transient crud on your tape head. The fact is, it doesn't take much to produce a jumbo error.

What it does take is a whale of a lot of care to keep your possibility of EDP error down to a manageable minimum. And the easiest place to start is in your selection of computer tape. How? By specifying BASF.

At BASF, we put a great deal more effort into producing tape to our standards, rather than industry standards. Take a small detail like tape width. Industry standards say a tolerance of ±.002" is okay. Our standard is pegged at ±.001". A small detail maybe. But to us it's the difference between a whale and an elephant.

One thing more. Our tapes don't cost any more than the competition's. You're already paying for BASF quality . . . you might as well have it. Write today for the complete story of how BASF computer tapes stack up against the competition. Remember, nobody makes a better tape than the people who invented it. BASF Systems, Crosby Drive, Bedford, Mass. 01730.

When it's BASF...you know it's

AQUARIUM
BASF
not the tape that goofed.

Cooperation, Not Competition, Is Spirit of Chug

By Toni Wiseman

Of the CW Staff

MILWAUKEE, Wis. – "The main thing about Chug is that hospital users are not competitive, so it's a real cooperative exchange of programs and ideas among people with common problems and interests," said Joseph W. Hamilton, controller at Foote Memorial Hospital, Jackson, Mich.

Chug – Cooperative Health Care Users Group – is an association of computer-oriented professionals in the health care field who use NCR equipment (or have an NCR computer on order).

Most of the 140 member organizations are hospitals, according to Bradley C. Roark, Chug spokesman, but the membership also includes nursing homes, clinics and data centers that do processing (billing, diagnostic and statistical work) for doctors and hospitals.

Membership in Chug is by organization. An $18 annual fee entitles an organization to send as many representatives as it desires to the meetings and assures that organization one vote in decisions of national purchasing agreements, functions and elections.

Mixed Feelings

Chug holds two meetings each year – one for Chug members only and one in conjunction with the Federation of NCR User Groups. The feelings about the latter meeting are mixed among Chug users.

Societies/ User Groups

"The meetings (with the national group) are great because there are definite things on software and operational experiences which you can exchange with these people and then apply to the hospital field," said Grace Householder, director of data processing, Weirton General Hospital, Weirton, W. Va.

Bill Karnes, director of data processing at Northwest Hospital, Amarillo, Texas, does not feel the joint meetings are as effective because "to get real benefits you have to deal with our specialized area."

Chug meetings consist of workshops, panel discussions, presentations by outside authorities such as HEW and Hospital Financial Management Association personnel, as well as an entire morning devoted to meeting with NCR representatives.

Members agree that NCR has been "fairly" receptive to their problems, but feel Chug has not used its collective weight sufficiently to influence changes the health care field needs.

"We've gotten some modification in service contracts which were more applicable to hospitals because we run seven days a week," said Hamilton, "but we haven't used our clout enough."

Roark feels more pressure will be applied in the near future because "we've come to the conclusion that some of the things NCR has done in providing applied systems just don't meet what we need."

Apart from the benefits derived from exchanging ideas with professionals in the field, members cite program exchanges as a major benefit of membership.

Chug publishes a listing of programs such as preventive maintenance of medical applications, which members have already written and the hospital then contacts that member directly. Chug itself does not maintain a central storage place for the records, which are exchanged free of charge or for a minimal copying charge.

"We've picked up a couple of systems ourselves," said Karnes, "and it's saved us a lot of programming."

Chug also has several national agreements with suppliers, according to Roark, whereby members can get substantial reduction on cards, paper, tapes, etc., though Roark does not feel most members take advantage of the opportunity.

"Chug is the best thing I've ever belonged to," said Householder. "I belong to DPMA and like it very much, but Chug has given us far more."

The only change she would like to see, a change Karnes also proposed, is the publication of a monthly or quarterly newsletter with articles from "different people who have been successful or have not been successful and can warn you about the pitfalls."

Conference Highlights I/O Systems in Future

CHICAGO – A keynote address on the role of input/output systems in the future data processing environment will set the stage for "I/O Systems '73," sponsored by the Data Processing Suppliers Association (DPSA).

The first one-and-a-half days of the seminar will review data entry systems with presentations on "Evolution of Key-to-Disk Systems into Mixed Media," and "Off-line Key-to-Tape Data Communications Systems."

The second day's program will include a discussion of optical scanning as a part of the total data entry system, and the evolving applications of the minicomputer in the I/O environment.

Presentations on the third day will pertain to the banking industry; production report systems and new developments in security; and library control.

Point-of-sale systems will be emphasized on the final day of the conference with a preview of the latest developments in POS and an analysis of existing systems.

Registration for the conference is $150 or $50 per day.

"I/O Systems '73" will be held at the O'Hare International Tower, Oct. 16-18. It will also be held Nov. 13-15 at the International Hotel in Los Angeles, and Dec. 4-6 at the Sheraton Hotel in New York.

Further information can be obtained from 1116 Summer St., Stamford, Conn. 06904.

GMIS Attendees to View Criminal Justice Systems

VAIL, Colo. – A panel discussion on criminal justice information systems in six states will be one of the highlights of the Government Management Information Sciences (GMIS) conference to be held here Oct. 3-5 at the Manor Vail Lodge.

Wednesday's sessions include "The Planner's Computer" and "Geographic Coding Systems & Census Data Systems."

In the afternoon a vendor panel will explore the intricacies of Codasyl.

GMIS Project/74 will be discussed both Wednesday and Thursday.

Local government data processing self-audit services, and the Computer Assisted Natural Disaster Operation (Cando) will fill Friday's schedule.

Registration fee is $25 for members, $35 for others. Further information is available from GMIS Fall Conference, Manor Vail Lodge.

Announcing UCC FIFTEEN.

Finally, automatic correction of restarts is here.

A unique, new software package we call UCC FIFTEEN makes restarting a job a matter of seconds rather than hours.

It corrects OS catalog information and generation data group biases at computer speeds.

So programmers, who are probably wasting more time than you realize on rerunning, are free to be more productive.

And deadlines that are being missed can be met.

UCC FIFTEEN permits you to restart at the proper job step. The OS catalog is corrected, existing direct access data sets that are to be recreated are automatically deleted, and GDG biases are properly altered for the rerun.

Skipping steps is possible, and the program is easy to install, takes only seconds to execute.

With UCC software, you take charge under OS. For the details call the Special Products Marketing Group at 214/637-5010, Extension 3422, or mail this coupon.

☐ UCC FIFTEEN. C912

☐ UCC ONE (TMS). Tape management software to protect valuable data under OS, ends handwritten records, gives real-time control.

☐ UCC TWO (DUO 360/370) lets you run your DOS programs under OS without conversion. Over 170 in use today.

☐ UCC TEN (Data Dictionary/Manager) Centralizes, controls data definitions, automatically generates data base control statements, facilitates new systems design.

☐ UCC FOURTEEN. Permits unmodified 1400 programs to run on any 360/370 OS system, with access to OS features.

☐ Please send me more information.

☐ Please have someone call me.

Name__________
Title__________
Company__________
Address__________
City/State/Zip__________
Telephone__________

UCC
UNIVERSITY COMPUTING COMPANY
7200 Stemmons Freeway
P O Box 47911
Dallas, Texas 75247

© 1973 UCC

UCC leadership software

Introducing

* * * * *

THERMO-465

A totally new magnetic tape. It operates at

400°F

Or at

65°F below zero

Thermo-465, the only product of its kind, was developed by Graham Magnetics, makers of the world's first and only permanent computer tape.

If you have a need for a magnetic tape that functions perfectly in extremely high and/or extremely low temperatures, Thermo-465 is the answer.

Tests results show Thermo-465 both meets and exceeds the stringent environmental requirements for use in systems for aircraft crash recorders.

After exposure to temperature extremes of +400°F and −65°F, it shows no change in its operating characteristics nor in its signal strength. Recording and playback is error-free in every instance. Data has even been recovered after exposure to temperatures up to 800°F.

Thermo-465 is available in 1000′ lengths and ¼″ or ½″ widths. Other configurations available on request.

If you'd like to place an order or would like more information concerning possible applications for this new product, write Graham Magnetics Incorporated, Dept. 465, Graham, Texas 76046, on your letterhead.

GRAHAM
MAGNETICS
Graham, Texas 76046

Another new product from the Research Center of Graham Magnetics, Inc.

SYCOR PRESENTS THE LATE, LATE SHOW.

Late at night, long after your office people are asleep, your Sycor 340 is hard at work.

Alone.

Polled by the master station via dial-up lines, it automatically transmits the data your people entered the day before.

Next day, the processed data is waiting with your morning coffee.

Our Sycor 340's knack for clean source data entry is what makes it all possible. By making it impossible to enter the wrong data in the first place.

Using our powerful, yet easy to use T.A.L. programming language, you can tailor the 340's 8K bytes of memory to your specific applications.

In fact, you can further enhance the 340's built-in error detection and arithmetic capabilities to include operations like Range Checking, Table Look-Up, Multiply and Conditional Data Entry.

And, thanks to T.A.L., you do it at a fraction of the cost of developing your own software.

As you might imagine, unattended communications is just one of the advantages of our Sycor 340. Advantages only an intelligent terminal can deliver.

To find out more, contact your Sycor representative today.

You might sleep a little easier tonight.

SYCOR

SYCOR INC

Corporate Offices: Ann Arbor, Michigan 48104 (313) 971-0900. **District Sales Offices:** Atlanta (404) 457-1166 • Boston (617) 890-7290 • Chicago (312) 986-1833 • Cleveland (216) 831-8625 • Dallas (214) 521-6710 • Detroit (313) 522-0080 • Hartford (203) 529-1100 • Houston (713) 688-5224 • Indianapolis (317) 784-6779 • Los Angeles (213) 640-0120 • New York (212) 371-9050 • Philadelphia (609) 665-1170 • Pittsburgh (412) 922-3350 • San Francisco (415) 349-6626 • St. Louis (314) 878-0090 • Washington (703) 525-7300. **Canada:** Sycor International Ltd., Toronto (416) 429-0883. **Service Centers in 80 cities.**

Sycor has opportunities for experienced data processing equipment salesmen and systems engineers in major cities.

Study Finds Jews Die Younger Than Gentiles

MIDDLETOWN, Conn. – A seven-year comparative study, undertaken with the aid of computers by a Yeshiva University doctoral candidate, shows that Middletown Jews die younger and more frequently of cardiovascular disorders and tumors than their gentile counterparts.

The study was undertaken by Dr. Jacob Jay Lindenthal, associate professor of sociology at Rutgers University, New Brunswick, N.J. He compared an equal number of data on the Jewish and non-Jewish communities from 1852 to 1934.

Other statistics showed Jewish women more likely to be single, divorced or widowed than gentiles. Also, Jews married at later ages and had fewer children.

During the 19th century, the study found, Middletown Jews paralleled the occupations they had in Europe, while in this century increasing proportions of Jews entered the professions.

Lindenthal said the purpose of the study was to "develop a model for the future writing of the history of Jews in small communities."

Scientists Aim to Put More Meat on Hoof

IRVINE, Calif. – Can computers improve the growth rate of meat-producing animals? Scientists here think so.

Smith Kline & French Laboratories has installed a Varian 620/f-Vortex computer system to record and analyze such experimental data as the length of time animals spend eating and drinking, how many times a day such consumption takes place and the quantities consumed, stomach contractions and measures of animal mobility.

The scientists are studying meat producing animals and the efficiency with which they convert food intake into protein, with the end view of improving growth or weight-gain rate.

Jobless Claimant Cut Short

VANCOUVER, Canada – A claimant caught the Unemployment Insurance Commission's (UIC) computer shortchanging, and then discovered that despite his perspicacity he will have to wait until he files next year's income tax forms to get his money.

The payment problem stemmed from the fact that the UIC program was not in step with the new tax rate table that the department of national revenue sent out in April. Consequently it has been deducting too much from jobless benefits.

Tony Strachan, UIC public information officer, said the UIC is aware of the problem and is taking steps to remedy the situation.

Input is Newput- in our September 26th Input Supplement

The input terminal has become the most important development in data processing input since the Hollerith card – which it is fast replacing. Terminals are being used in an amazing variety of applications to capture data right at the source – often entering it directly into the CPU. From large DP centers to your friendly neighborhood supermarket and restaurant, you can find these new input systems (including terminals, OCR and MICR) quietly collecting information. And that's what our Input Supplement is all about.

Edited by Ron Frank, this supplement will look at new equipment, new techniques, and a variety of applications. We'll have stories from users – what they're doing, how they're doing it, and how it's working out. And we'll take a look at what's ahead. Overall, you'll get a fairly complete look at the state of the input art, in our September 26th Input Supplement.

If you're marketing products in this area, you should be advertising in this important supplement. Closing date is September 7th, and more details are available from the nearest *Computerworld* representative, or write to: Judy Milford, *Computerworld,* 797 Washington Street, Newton, Mass. 02160.

Boston	New York	Los Angeles	San Francisco
Bob Ziegel	Don Fagan	Bob Byrne	Bill Healey
(617) 332-5606	(212) 594-5644	(213) 477-4208	(415) 362-8547

Codex introduces a way to beat the high cost of wideband service for sending data at 19,200 bps.

Until now, you couldn't transmit data with a low error rate (on the order of 1×10^{-6}) over voice grade lines faster than 9600 bps. To go faster, you had to use the more expensive wideband service. But now, Codex has devised the first alternative . . . the Codex Biplexer. It uses two voice grade lines to simultaneously transmit 19,200 bps; which, if you were transmitting data say 1000 miles, would cost you about $7,000 a month less than wideband service.

If you need more than 9600 bps capability, cost is not the only advantage the Codex Biplexer gives you over wideband service. You can't monitor or test a wideband circuit, and alternate facilities or a restoral path are virtually non-existent. The Codex Biplexer has automatic fallback and fall-forward selection so that if one channel fails, the system will automatically adapt to a single channel. When the outage is cleared, it will return to full operation. And using its built-in monitoring features, you can isolate failures anywhere in the communication system. In addition, the Codex Biplexer allows diverse routing and can mix land line and satellite transmission.

The new Codex Biplexer is just one new way Codex is changing the face of the communications world. And products are just the starting point – our people can integrate your whole communications system. In short, Codex offers total systems capabilities: concept, equipment and people.

Call or write Codex Corporation, 15 Riverdale Ave., Newton, Mass. 02195. Telephone (617) 969-0600.

codex

We'll get you through

MEMBER OF IDCMA

Courses Under NYU Certificate Focus on Systems Programming

By Frances D. Smyth
Special to Computerworld

NEW YORK – New York University's Data Processing and Systems Analysis Institute is pioneering in the field of systems programming education with the creation of a Certificate in Systems Programming course of study. Beginning this fall, students may register for a six-course curriculum leading to the certificate.

All courses are taught by DP practitioners and constitute an in-depth view of IBM Operating System software design. To NYU's knowledge, this is the only program of its type in the New York area.

The Advanced Assembler and OS Data Management Coding courses are completely new offerings. The other courses have been revamped and brought together in the new curriculum.

The program is a part-time effort presently limited to evening courses. The institute anticipates students will complete the program in three terms.

Job Control Language is a detailed analysis of all the language facilities and specifications. Heavy emphasis is placed upon exercises and practical applications of the techniques presented.

Advanced Techniques in Assembler Language requires a knowledge of Assembler specifications garnered from either practical experience or prerequisite courses.

Education

OS Supervisor and Data Management Coding concentrates on sequential, direct and partitioned access methods and data set organization as well as the linkage editor and loader programs.

OS Control Program Logic and System Generation explores the internal structure of the operating system with emphasis upon system control blocks, job and task management, the task dispatcher and the I/O supervisor.

Compiler. Design is a survey course exploring translation of source language programs via direct and syntax-oriented methods. Stress is placed upon compiler implementation techniques.

Computer Architecture focuses upon the structure of the IBM 360.

All courses are presented by the Data Processing Institute of NYU's School of Continuing Education at or near the Washington Square campus. Each of the courses costs $130, except Control Program Logic which is $145.

The certificate program is the responsibility of Professor Stuart Fink, Associate Director, The Division of Business and Management at Room 327, Shimkin Hall, 50 West Fourth St., 10012.

Smyth is in the Management Controls and Information Technology (MCIT) group at Kennecott Copper Corp. and is an instructor at New York University.

Data Seminars Set

MIAMI – "Data Communications – the Executive Imperative," a two-day ICC Institute seminar conducted by Dr. Dixon R. Doll for executive and operating personnel, will be offered on opposite coasts during October. On Oct. 1 and 2, it will be presented in San Diego, and on Oct. 15 and 16, in Newton, Mass.

The course covers data communications terminology, cost effectiveness, transmission problems, terminals, modems, multiplexers and overall system design. The ICC Institute itself is here in Miami at 7620 N.W. 36th Ave., 33147.

Growing the world's leading computing capability

In 1966 UCC pioneered the concept of providing large-scale computing power to remote users via telephone lines and terminals located at the customer's site.

Stimulated by the revolution in advanced technology and the appreciation of an ever-growing list of customers for user-oriented services, UCC now maintains 13 large-scale computer systems. This growth has made UCC an international leader in the field of scientific and engineering computing.

During this time, UCC has taken many major steps to enhance the value of its services:

- Built one of the finest staffs of technical people in the industry. Consisting of data processing professionals, engineers, and scientists, this staff supports our customer at every level.
- Developed a library of the most advanced and sought-after technical application programs available.
- Developed our own communications controller to handle more remote customers more efficiently.
- Developed the UCC FASBAC System providing convenient interactive processing with direct access to our 1108's via any number of conversational (keyboard) terminals.
- Introduced the Coupled System: Two UCC 1108/FASBAC Systems linked together This unique UCC development provides greater system availability and faster turnaround, since the load level of each processor is automatically optimized by commonly shared communication controllers.
- Maintained our own full-time hardware maintenance and communications engineers, to assure customers of reliable and convenient access.

Now UCC is taking other steps for greater customer satisfaction:

- The newly created Scientific & Engineering Division will be dedicated to satisfying the growing requirements of industry for advanced and responsive computing technology
- Taking full advantage of improved communications technology, a broader communications network is being established. This network will allow our customers better utilization of the concentration of men and machines resulting in an exceptional level of back-up and faster response to systems, applications and communication problems.
- Introducing UCC 6000 Services, will provide the convenience of one vendor service for all scientific and engineering processing requirements.

Customers usually call UCC because: (1) They want upward expandability without capital investment, (2) They want reliable access to reliable systems; (3) They want technical support and expertise on a local level.

We've learned – when customers get what they ask for, when they ask for it – UCC grows. Ask us! Call collect or write. John Gindling, Scientific & Engineering Division 214/637-5010 (or your nearest UCC office)

UCC leadership services

UCC
UNIVERSITY COMPUTING COMPANY
7200 Stemmons Freeway P.O. Box 47911 Dallas, Texas 75247
A Wyly Company

Computer Leasing Seminars

A series of computer financial leasing seminars will be presented jointly by Telex Computer Products, Inc. and Capital Marketing Corporation during September and October. Also in attendance at the seminars will be representatives from one of the largest financial institutes in the country. The seminars will cover financial and operating leases associated with IBM System 370 CPU's, Telex peripherals, and other aspects of profitability associated with leasing for the user.

Two sessions will be held in each of the following cities on the dates indicated:

San Francisco	Sept. 11	Detroit	Sept. 26
Los Angeles	Sept. 13	Cleveland	Sept. 27
Dallas	Sept. 18	New York	Oct. 2
Atlanta	Sept. 20	Boston	Oct. 3
Chicago	Sept. 25	Philadelphia	Oct. 4

Complete information on the seminars, their meeting times and locations is available from these Telex Area Managers:

WALTHAM, MASS.—Al Lucchese
460 Totten Pond Road (02154)
(617) 890-49[illegible]

NEW YORK—Frank Jerd
6 East 43rd Street (10017)
(212) 867-9780

ROCKVILLE, MD.—John Kerr
6110 Executive Blvd. #222 (20852)
(301) 881-7610

MIAMI—Bob McLeod
7600 Red Road, Suite 305 (33143)
(305) 661-7641

CHICAGO—Jerry Johnson
111 East Wacker Drive (60601)
(312) 644-5100

SOUTH FIELD, MICH.—Bill Bones
21415 Civic Center Drive (48076)
(313) 358-1195

SAN FRANCISCO—Bob Hicks
Fibre Board Building,
55 Francisco St. (94133)
(415) 398-4888

ENCINO, CALIF.—Ron Bromwell
16255 Ventura Blvd.,
Suite 401 (91316)
(213) 986-9252

DALLAS—John Joyce
11311 North Central Expressway,
Suite 206 (75231)
(214) 691-6861

MAKE YOUR RESERVATION NOW.

where the difference begins
TELEX
the Preferred PERIPHERAL COMPANY
TELEX COMPUTER PRODUCTS INC
6422 East 41st Street • Tulsa, Oklahoma 74135 • 918 [illegible] 1111
TELEX, LTD
101 Duncan Mill • Don Mills, Ontario, Canada • 416 445-8050
TELEX EUROPEAN GROUP
213 Oxford Street • London WIR-IAH England • 01 734 9131
Paris • Frankfurt • Zurich

Hopper's Theories Played Out in Railcar Switching

By E. Drake Lundell Jr.
Of the CW Staff

ATLANTA – Theory and reality shared a platform here last week as one of the first implementors of Capt. Grace Hopper's ideas discussed how he had carried out her theories on distributed data bases and systems of computers.

While Hopper continued to expand her thesis on the future of "systems of computers" as opposed to computer systems, G.C. Durand of the Southern Railway System described to the ACM conference a commercial application of a minicomputer network that relies on distributed data bases for part of its functions.

Railcar Switching

The system basically uses a network of minicomputers to control the operation of a railcar switching yard in Sheffield, Ala., but it also reports to a minicomputer-based MIS system there, which in return receives information from and sends information to a larger system in Atlanta.

The system is made up of five Data General Nova 1200s of which two are used for the process control functions in the yard itself, one for the MIS system and two for backup at all times.

The process control systems in the yard control the movement of cars through a complex monitoring system that reports the location of all cars to the MIS system, which in turn reports down to the process computers where each of the cars from an incoming train should be routed to make up an outgoing freight.

The two process computers follow the laid-out arrangement and report back on the status of the cars to the MIS system which then plans how they will leave the yard.

Coordination with Atlanta is handled strictly through the MIS system, which transmits the information needed by management to the larger system, but without the details on the specific operations of the yard.

Hopper: 'Prepare Now'

Hopper, for her part, indicated the computer community should start its planning now for the coming of the networks of computers that she foresees as the major tool of DP in the future.

Today, she said, most of the inefficiencies in systems come from having to load all of the programming and systems ovcrhead on one system, whereas she predicted that many of these problems will be reduced because "we will be using networks of systems with each computer in the network dedicated to certain applications" and closer to the ultimate user of that system.

"Computers will become items of convenience," she said, and people will begin to view computers much like they do typewriters today and place them close to the user of the system.

But for the systems of computers to be successful, Hopper said a great deal of research was needed now on DP itself, and not just computer science.

There should also be more work done on writing modular programs, she said, since these types of programs will be easier to transfer to the systems she envisions than large systems written for the big computers of today.

'Advantage of Confusion' Praised

ATLANTA – Many DPers have lamented the confusion of the profession in the area of job titles and formal training, but one of the industry's top scientists feels the confusion and chaos may be a good thing after all.

"For now," said Dr. Lewis Branscomb, chief IBM scientist, "let's realize what an enormous advantage that confusion is for encouraging the introduction of new ideas and the acceptance of talents from the traditional disciplines.

"Even more important, I believe the information sciences can and must be the catalyst – or perhaps the glue – that provides the common intellectual meeting ground for learning to manage abundance in the future," he said.

"Without the complex systems point of view of the community that shares an interest in computers, the specialized experts in the natural and social sciences will have grave difficulty solving multidisciplinary problems on a global scale," he said.

"We have excellent examples in our profession of the true generalist through whose efforts professional expertise reaches public awareness and brings constructive public decisions," he added.

But while this is good for now and an opportunity, Branscomb did recognize that academic distinctions and rigid job descriptions will creep into the DP field, but he felt that the later the better.

New World Group Seen Problem Solver

ATLANTA – The mission of the International Institute for Applied Systems Analysis symbolizes "the hopes of many of the world's nations" for solutions to the myriad problems facing the world, according to Dr. Lewis Branscomb, chief scientist at IBM.

Keynoting the 1973 ACM annual conference, Branscomb called on the U.S. computer community to help launch the new world body that will be cooperatively established this fall by leading academies in 12 nations of the world, both from the East and the West.

The purpose of the organization, he said, will be to "initiate and support individual and collaborative research on problems relating to modern society which arise from scientific and technological developments."

The programs to be undertaken by the new institute concern problems common to all nations, "where we have much to learn from each other and where we can gain maximum benefit by concerting our efforts," he said, noting the programs will involve computers and data processing heavily.

"Nevertheless, even the institute's strongest supporters would hesitate to predict certain success for this international effort," he said, noting that many such international bodies get mired down in politics.

IF YOU WANT THE BEST AUDIO-VISUAL EDP TRAINING SYSTEM

Get it from edutronics!

The EDUTRONICS TOTAL SYSTEMS APPROACH is simply the best audio-visual EDP training system available.

Why? Because with it thousands of EDP professionals, from programmers through top management, have learned and developed their skills more effectively than with other methods.

They've discovered that our full-color videotapes and films, study guides, workbooks and other materials are effective. And make learning more enjoyable.

They've also discovered that the EDUTRONICS TOTAL SYSTEMS APPROACH can be used anywhere for any length of time by anyone regardless of specialization, corporate position or economic justification.

Discover what Edutronics can do for your company. Call or write for a demonstration today.

edutronics
systems international, inc.
Lakeside Office Park, Wakefield, Mass. 01880
(617) 246-0914

Boston (617) 245-6980
Chicago (312) 787-1722
Dallas (214) 233-9166
Kansas City (816) 756-0400
Los Angeles (213) 380-7811
New York (212) 421-4610
San Francisco (415) 989-0417
Toronto (416) 484-1992
Washington, D.C. (202) 223-2614
Winnipeg (204) 786-1434
also in London and Paris

A Coleman American Company

Boole & Babbage

Put Us On The Spot . . .
If You Are!

If you are considering configuration changes or program optimization—call us.

We invented the word measurement . and the business

Boole & Babbage develops and markets Systems Measurement Software for OS, DOS, and now for VS

Our software measures systems, programs, and hardware configurations . reduces costs because your applications run better and faster typically 30 to 40% better and faster

Call or write the Leaders in Computer Performance/Measurement Products and Services for additional information on.
Computer Performance Monitoring;
User Job Accounting and Systems Statistics.
Data Set Optimizing; Program Optimizing,
and Tape Library Control.

Boole & Babbage, Inc.
850 Stewart Drive
Sunnyvale, CA 94086
408/735-9550

Name
Title
Address
City State Zip
Telephone ( )

This Week's Checklist

How Secure Is Your DP Center?

TORONTO – Is your computer installation secure? Or is it vulnerable to costly damage from the hazards of fire, floods, mechanical breakdowns, fraud and lost programs and data files?

A simple way to determine the security of your computer system is to check it against this week's installment of security "musts" concerning center location and construction:

- Locate the computer center in a separate building to minimize exposure from fire and water damage in adjacent occupancies and to make it easier to monitor access.
- If the center is not in a separate building, locate the organization's offices in the floors above and below the center so that all stairways and elevators can be monitored.
- Locate the center above the ground floor to protect from flooding, backed-up sewers and broken water mains. The center should not be higher than the third floor, so that it is accessible to firefighting equipment.
- Locate the installation away from external walls with windows to reduce the risk of damage from forcible entry.
- Build the outside walls of the computer center of brick or concrete blocks, capable of withstanding explosions.
- Construct a windowless computer center or choose shatter-proof construction for the windows.
- If regulations allow, limit the number of entrances to the center to two: one for personnel and one for supplies.
- Arrange the locks on emergency exits so that they operate an alarm if they are opened from the outside.

Checklist compiled by DCF Systems Ltd., 74 Victoria St., Toronto, Ontario M5C 2A5.

Detroit Softball League May Assume Sophistication

DETROIT – A computer has been proposed to solve the problem of ineligible players – "ringers" – in Detroit area softball leagues.

Some leagues have required that players be fingerprinted and photographed, but even that method has proven unreliable, due partially to changing hair styles, according to Harold Rice, Mt. Clemens recreation director.

Rice has proposed a computer registration by Social Security Number. The information would be fed into a central computer, and a check of the information could identify any ringers or verify the identification of any player.

"If a player tried to join another league and used his Social Security Number, the computer punch-card system would reject the application because the number was previously used," Rice said.

Canada Wants DPers

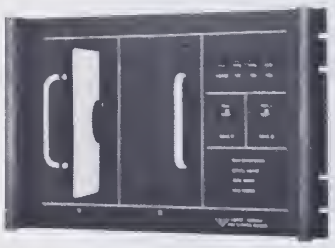
MONTREAL – "Go north young man and seek employment," said the counselor to the programmer.

Sound advice, according to Larry O'Keefe, vice-president, systems, Bell Canada Ltd. "Canada is suffering a shortage of technical personnel qualified in systems and data processing," he said.

Company Raids

Bell, according to O'Keefe, could find the people it needs in Canada, but would have to "denude" other companies to get them.

Instead, the company plans to acquire a few key managers now, but in the future, "except for special exotic skills, we intend to generate and train our managers internally."



FLOPPY DISK

RANDOM ACCESS * RELIABLE * LOW COST

The AED 2500 is a complete minicomputer compatible disk sub system. The formatter (or controller) can handle up to four disk drives with a total storage capacity of 524,288-16 bit words (131,072 per drive). The data transfer rate is 15,625-16 bit words/sec.. Track access time is 10 M.S. per track with a settle time of 10 M.S. at final track.

Computer compatible interfaces are available for:

* NOVA series computers
* DEC PDP-8
* DEC PDP-11
* Varian
* HP-2100
* Interdata

Interfaces for other popular minicomputers will soon be available.

Prices start at $2,750 for a complete minicomputer compatible disk system. Price includes:

* One high performance disk drive
* Computer interface
* Power supply
* Formatting electronics
* Software driver
* Cable and mechanical pack.

Options include DMA computer interface at $200, and extra drives at $975 each.

Delivery is 30 days ARO from ADVANCED ELECTRONICS DESIGN, INC., 3197 Park Boulevard, Palo Alto, California, 94306. (415) 493-4914

DOS 360/370 USERS!

ARE YOU FRUSTRATED WITH THE HIGH COST OR OVERHEAD OF YOUR SPOOLING SYSTEM?

Over 200 installations have chosen DOS ASAP THE ECONOMICAL ALTERNATIVE.

Users range from non-mps 360/22's to 370/155's batching 3 partitions.

ASAP features include:

- Immediate Device Start
- Imaginary Devices
- Partition Balancing
- AVR
- Supports 3 User Partitions
- Minminal Requirements

. . . and many more

Also, our RELO-PLUS package provides complete program relocation and blocked fetch capability.

For further information on ASAP and RELO-PLUS call us or complete and return the attached coupon.
Universal Software, Inc.
Commerce Park
Danbury, Conn. 06810
(203) 792-5100

In Europe, contact:
Westinghouse Management Systems,
41, Avenue George V
75008 Paris, France

Universal Software, Inc.
Commerce Park, Danbury, Conn. 06810

Have a representative contact me.

Send additional information on

☐ ASAP, ☐ RELO-PLUS

My Computer equipment is

Name
Title
Company
Address Tel No
City State Zip

Notre Dame to Put CAI Courses to Test

NOTRE DAME, Ind. – If nothing else, using computers as instructors will eliminate the problems of teachers' pets.

The University of Notre Dame has received a $220,000 grant from the Alfred P. Sloan Foundation to design and evaluate computer-assisted instruction (CAI) programs for two undergraduate economics courses and one in history.

The CAI programs are designed to supplement lectures and replace discussion groups. Students will use teletypewriter terminals to interact with the computer, which will quiz them, and explain why their answers are right or wrong.

In each course, students will be divided into CAI and non-CAI groups. The various groups will be tested and the results compared to determine which form of instruction is superior in quality. Student feeling about the different methods will also be evaluated and the cost of the two methods compared.

Generous Computer Meets Its Match

DALLAS – People are always complaining about computers which send them unwarranted or faulty bills, but what happens when the computer sends out more money than it should? People still complain.

Private citizen Roger Allen was receiving excess payments from the Veteran's Administration, a situation he tried to rectify for four months, but to no avail.

'Pay It Back'

In response to a four-page letter he wrote explaining the situation and a trip to the VA office he merely got more benefit checks, and finally letters – demanding he pay back the excess funds. No mention, however, was made of the amount to be repaid.

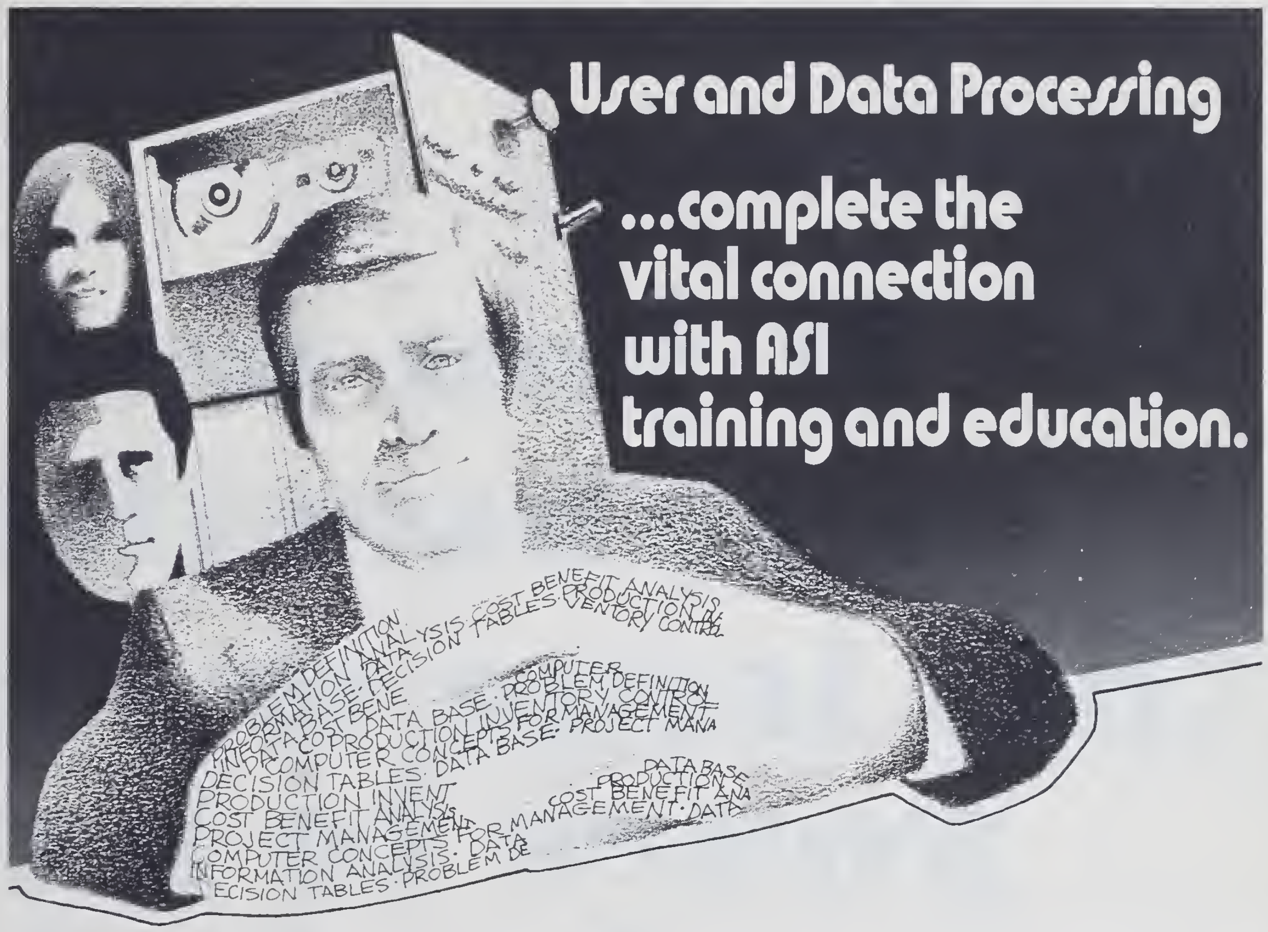
Eventually the matter was placed in the hands of the U.S. Attorney's office, requesting that Allen be prosecuted for fraud. Allen was overjoyed by this turn of events, since, being an assistant U.S. attorney, he was finally able to take matters into his own hands and clear the situation up – officially.

Carpools? Maybe in 1980

CARROLLTON, Texas – A bellyflop in a car pool? That's what a computer seems to have performed in an effort to solve problems of ecology, gasoline rationing, smog and rapid transit.

The president of the Metropolitan Commuter Association, Mrs. Leroy Eastburn, said her idea of starting a computer bank of commuters isn't catching on and no one knows why.

MCA officials attributed the foundering to a general lack of interest by the public to form carpools, the minimal population density of the area and, as Eastburn said, "People are just not ready here for the idea. It's a 1980 idea for Dallas."


User and Data Processing
...complete the vital connection with ASI training and education.

Computers and computer people have become a vital, integral and growing part of your investment. Their machines can save you time, money and aggravation. Yet, does it often seem as though there is something incomprehensible about the people and something faintly sinister about their machines that hum and whirl and blink and spew out reams of printed paper?

Advanced Systems Incorporated has a way for you to overcome that feeling of intimidation. The feeling that you're not getting what you want, when you want it. It's called education and training. And it works through Video Assisted Instruction. The courses are on video and audio tapes with a comprehensive student and instructor's guide. The tapes can be used in-house on a one-to-one or a group basis and are available on a lease or buy plan.

We have a total curriculum of courses like Computer Concepts for Management, Project Management, Cost Benefit Analysis, Production Inventory Control and many others all designed to give you a better understanding of how computers can help you. And better information and understanding lead directly to greater profit.

ASI is the world's largest supplier and producer of in-house video assisted instruction with a client list that reads like an international "Who's Who" of financial and industrial institutions, government and education. We believe the end result of education must be quantifiable, measurable change. And our instructional and training systems are designed to produce results now.

For more information on how ASI can help your people, fill out and mail the coupon.

Developing today's Man for tomorrow's challenge

ADVANCED SYSTEMS INCORPORATED

Corporate Office, 1601 Tonne Road
Elk Grove Village, Illinois 60007
Phone 312/593-1790

Offices in Atlanta, Boston, Chicago, Cleveland, Dallas, Detroit, Los Angeles, Minneapolis, New York, Philadelphia, Pittsburgh, San Francisco, St. Louis and Washington. D.C.

International affiliates in South Africa, Australia, Canada, England, West Germany, Iran, Mexico and Sweden.

ADVANCED SYSTEMS INCORPORATED
Dept. 2
1601 Tonne Road/Elk Grove Village/Illinois 60007
Please send me more information on your User's Curriculum.

NAME ____________________
TITLE ____________ PHONE ____________
COMPANY ____________________
ADDRESS ____________________
CITY ________ STATE ________ ZIP ________

New System 370's Attractive Delivery Schedules.

For Sale or Lease. Terms: From 3 Years.
ITC Available. Contact Ed Tibbits or Dean Harrer.
at (315) 474-5776

SYRACUSE, N.Y. Midtown Plaza 13210 (315) 474-5776

CIS
CONTINENTAL INFORMATION SYSTEMS CORPORATION

Delivery Schedules

370/145 Model I2
Immediate Delivery

370/158 Model J

#1 Delivery	11/16/73
#2 Delivery	11/16/73
#3 Delivery	1/18/74
#4 Delivery	2/15/74
#5 Delivery	2/15/74
#6 Delivery	3/22/74

370/168 Model K

#1 Delivery	4/19/74
#2 Delivery	5/17/74
#3 Delivery	5/17/74

If you were a subscriber, this issue would be yours to have and to hole.

order your own subscription

Please send me COMPUTERWORLD for:

☐ 1 year – $9*

*$10 a year in Canada; all other Foreign, $25 a year.

☐ Charge My American Express Account:

If charge, we must have cardholder's signature:

335

September 12, 1973

First Initial | Middle Initial | Surname

Your Title

Company Name

Send to: Address

City | State | Zip Code

Address shown is: ☐ Business ☐ Home

☐ Check here if you do not wish to receive promotional mail from *Computerworld.*

COMPUTERWORLD • Circulation Department • 797 Washington Street • Newton, Mass. 02160

PLEASE CIRCLE 1 NUMBER IN EACH CATEGORY

YOUR INDUSTRY

01 Mining/Construction/ Oil & Refining
02 Manufacturing – Computer or data system hardware/peripherals/other associated mechanical devices
03 Manufacturing (other)
04 Utilities/Comm. Sys./Transportation
05 Wholesale/Retail
06 Finance/Insurance/Real Estate
07 DP Serv. Bureau/Software/Planning
08 Business Services (except DP)
09 Education/Medical/Legal
10 Federal, State and Local Government
12 Communications/Printing/Publishing
13 Other:

YOUR FUNCTION

01 Corporate Officer
02 Data Processing & Operational Management
03 Data Processing Professional Staff
04 Consultant
05 Lawyer/Accountant
06 Engineering-Management/Scientific/R&D
07 Sales/Marketing/Account Executive
08 Librarian/Educator/Student
09 Other:

COMPUTERWORLD
THE NEWSWEEKLY FOR THE COMPUTER COMMUNITY

CI Notes

Fujitsu, Hitachi Form Unit

TOKYO – Fujitsu Ltd. and Hitachi Ltd. are forming a joint firm for research and development as well as production and sale of peripheral and other DP equipment, according to a recent report in *The Japan Economic Journal.*

The firm, to be called Nippon Peripherals Ltd., will undertake work on disks, an area in which the Japanese makers lag behind foreign firms, the article observed.

The equipment produced will be sold by Fujitsu and Hitachi under the firms brand names.

In October 1971, the two firms announced joint development of a future generation of mainframes.

Memorex Talks to Debt Holders

SANTA CLARA, Calif. – Memorex Corp. is talking with holders of its senior debt as a possible alternative to its previously announced objective of selling an equity interest or seeking a business combination with another company.

A Memorex spokesman said talks with Control Data Corp. have not been terminated.

The firm is seeking to restructure its obligations and obtain creditors' support of an operating plan that is designed to permit Memorex to continue its operations as a viable, independent business.

Interdata Plans 'Bare Bones'

OCEANPORT, N.J. – Later this month, Interdata plans to release two new minicomputers in direct competition with Data General's recently released Nova 2s.

Like the Nova 2, the Interdata machine is going to be a "bare bones" system with the emphasis on price and will cost less than the Novas, a source said.

Supershorts

Chi Corp. has selected Regie Informatique, Paris, to handle its line of products for the Univac 1100 series in Europe.

– – –

Sycor, Inc. has produced its 10,000th intelligent terminal, which will be delivered to an office of the Insco Systems Corp. in Phoenix, Ariz.

– – –

General Automation, Inc. has shipped its first million dollars in minicomputers and computer systems to RCA.

– – –

3M Co. has licensed Data Recording Instrument Co., Ltd., England, to manufacture a drive for the "Scotch" brand data cartridge.

– – –

Exhibitors at the International Computer Exposition for Latin America have reported orders and sales worth more than $1.5 million, according to convention organizers. Attendance totaled more than 11,000, they said.

Wescon Set for Bigger DP Theme

By E. Drake Lundell Jr.
Of the CW Staff

SAN FRANCISCO – Sparked by a larger than normal contingent of computer and communications firms, the 1973 version of the Western Electronic Show and Convention (Wescon) this week will fill Brooks Hall here to capacity.

At the same time, it must be noted that the 500-booth show is still a far cry from the over 1,000-booth shows in the late 1960s.

However, with the absence of other competing OEM shows on the West Coast for the next several years, over 40 computer and communications companies will show their wares at Wescon – well over double the number in the past several years.

And on the technical program side, the emphasis on computers will also be played up with six sessions directly related to the application of computers and others covering the use of components for computer systems or expected developments in components affecting future computer systems.

The overall size of this year's show is slightly up from last year's version in Los Angeles and is running well ahead of the last Wescon in San Francisco in 1971, officials noted.

In addition, the show will have an international flavor with strong representation from the UK and Germany and a fairly good showing from Japan.

France will also be represented for the first time at Wescon.

The major emphasis in the computer and communications area will be minicomputers with Digital Equipment Corp., Data General and Hewlett-Packard all squaring off.

The OEM nature of the convention will be reflected in heavy representation from minicomputer peripherals firms.

However, most of the computers on the floor of the exhibit hall will not be in the computer section, but rather hidden as components of other control and testing equipment on display.

As an example of this at one recent Wescon show, there were 28 DEC computers on the floor but only one in the DEC booth, with the rest hidden in production control equipment and various circuit testers on display by other firms.

Commerce Study Predicts

German DP Market in '77: $2.6 Billion

By Molly Upton
Of the CW Staff

WASHINGTON, D.C. – The German DP market is expected to total about $9.5 billion in the 1973-77 period, according to a recent study by the U.S. Department of Commerce.

The German market is expected to grow from $1.3 billion in 1972 to $1.8 billion in 1974 and $2.6 billion in 1977, the report indicated.

Values are based on sales plus market value of equipment leased at the time of installation.

Imports, the survey noted, are expected to rise from $631 million, with a U.S. share of 48% in 1972, to $844 million, a share of 52% in 1974, and $1.1 billion, a 57% share in 1977.

Imports from the U.S. have risen from $202 million in 1970 to $303 million in 1972, the report indicated.

Minicomputers, peripheral equipment and data transmission equipment are expected to outpace other areas in terms of German sales during the period through 1977.

The share of the market held by minicomputers will jump from 16.5% or $209 million in 1972 to $330 million in 1974 and 21.5% or $565.7 million in 1977, the report predicted.

Sales of peripheral equipment purchased independently of mainframes are expected to grow from 14.2% of the peripherals market or $180.7 million in 1972 to $352 million in 1974, and should reach nearly 28% or $732.2 million in 1977.

Data Transmission Equipment

A seven-fold growth is forecast for data transmission equipment, from its 1972 base of $17.3 million to $46.5 million in 1974 and $119.4 million in 1977, according to the report.

Minicomputer installations are expected to grow from an estimated 37,000 in 1972 to about 72,000 in 1977, the report showed. It noted their potential for use in data communications applications, banking applications and technical and scientific purposes as well as manufacturing.

"The high cost of data transmission in Germany is inducing users to increase the number of data file sites in the belief that regular access to the local file, with only periodic updating of the central file, can cut transmission costs substantially," the report said.

The retail and wholesale trade sector installed about 3,550 minis in 1971, and by 1975 is expected to be using about 12,500 minis.

In the banking sector alone, there are 1,930 minicomputers installed, while small-, medium- and large-size computer installations number 767.

Federal, state, county and municipal governments are listed as operating 2,040 minicomputers and 416 other machines.

Remote terminals will be the star peripherals in the '70s, the report noted,

(Continued on Page 37)

360s Lease for 40%-50% off IBM

By a CW Staff Writer

NEWTON, Mass. – A recent survey of several large leasing firms indicates prices of 360s on a two-year lease are generally 40% to 50% off IBM's monthly availability charge, with fluctuations attributable to supply and demand factors.

Demand is strong for enhancements, such as add-on memory, and users are increasingly asking for Edos software and about accelerators, lessors said.

The 360/65 seems to be enjoying popularity at the moment. One firm said it hadn't transacted one within the past six months, as none were coming off lease. Another added that although his firm didn't have many, all were on long-term leases. Two firms reported they charge more for 65s than for 360/40s and 50s, and William Landis, vice-president of marketing for Randolph Computer, reported prices on 65s had risen 15% in four months.

However, George Springspeen, vice-president of marketing for Granite Computer Leasing, said in six months to a year the demand for 65s should drop when the 158 and 168 come out.

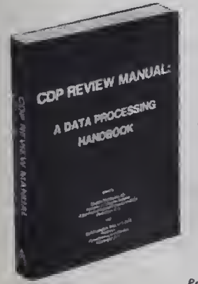
360/20s, of which DPA doesn't have many, command a 10% higher rate than the 30s, 40s and 50s, observed J.H. Broyles, regional sales vice-president.

Another lessor mentioned that some users were asking for very little resident IBM core and for add-on memory, "because they think it's cheaper." It is, if they're one of the first to ask for it, but then when the supply goes down, the price goes up," he said.

Over all, demand is highest for 30s, with all but one lessor agreeing. Several said demand was split fairly evenly between the 30 and 40.

On the subject of pricing trends in the next six months, the general opinion is that the market has firmed up.

Springspeen noted he has seen the 40 plunge in the last eight months, but added he thinks it has now bottomed out. The 30 prices have been stable, he added.



A New Standard Reference for Those Taking the CDP Examination

CDP REVIEW MANUAL

A Data Processing Handbook

*by Roger A. Mac Gowan,
Professor of Computer Science,
Department of Defense Computer Institute, Washington, D.C.
and Director of Compudemics, Inc.,
and Reid Henderson,
President of Compudemics, Inc. and a Certified Public
Accountant and Certified Data Processor.*

This mammoth handbook has been written specially for those who are taking the CDP certification test. It covers virtually every facet of the EDP spectrum – all the things you must know in order to take the test with confidence.

The Manual conforms to the format of the CDP Study Guide of the DPMA and contains text questions and answers for self-testing.

MAJOR EQUIPMENT COVERED. . .

- **Data Processing Equipment**
- **General Management**
- **Accounting**
- **Computer Programming and Software**
- **Data Processing Management**
- **Mathematics and Statistics**
- **Systems Analysis and Design**

The CDP Review Manual is not only a primer for the exam, it is also a handy reference to the continuing understanding of EDP management which you must have in order to advance professionally in the industry. It will help you understand the capabilities, limitations and applications of computer technology • plan and implement new computer technology • evaluate and improve existing systems • strengthen your qualifications for advancement.

Add the *CDP Review Manual* to your company or personal library.

Return this order coupon today. 632 pages, $12.50.

Send me_____copies of the *CDP Review Manual* at $12.50 each. Enclose payment and the Publisher pays shipping and handling charges.

Make checks payable to AUERBACH Publishers Inc.

☐ **Payment enclosed** ☐ **Bill my company**

Company ____________________
Name & Title ____________________
Address ____________________
City ____________________
State __________ Zip __________

**Send to: Computerworld Inc., Dept. A,
797 Washington St., Newton, Mass. 02160.**

AUERBACH
73N

Proposed Breakup Last Year

CDC Wanted to Split IBM Component, Terminal Units

By E. Drake Lundell Jr.

CW Washington Bureau

WASHINGTON, D.C. – There have been many proposals in the past few years for breaking up IBM if the Justice Department is successful in its suit against the industry leader.

But perhaps one of the most interesting was made to the Justice Department almost a year ago by Control Data Corp. (CDC), before it settled its case with IBM out of court.

The CDC proposal was made after studying the industry and IBM's role in it for almost four full years and after taking many depositions and amassing evidence for the prosecution of its suit.

The proposal was the result of several years' research by individuals familiar with the computer industry as well as antitrust lawyers.

What Does It Say?

The CDC proposal called for a combination of structural relief (i.e., breaking up IBM) and injunctive relief, or court orders, that would prohibit IBM from certain marketing practices and procedures.

"Additionally," according to the memorandum filed with the Justice Department, "the suggested measures would immediately insulate, and thereby avoid IBM potential dominance of, the related markets of data services, professional services and remote terminals."

Evidence uncovered by CDC provides "convincing proof of IBM's possession and direct use of monopoly power, as well as proof of the nature and deleterious effect of IBM's anticompetitive practices," the memo said.

"The importance of early and stringent relief dissipating IBM's monopoly power is no longer debatable," it added.

Under the proposals for structural relief in the computer industry, the CDC brief proposed:

- "Divestiture of IBM's Components Division and prohibition of IBM from reentering the business of manufacturing semiconductors or other components.
- "Divorcement of IBM from the business of manufacturing and marketing remote terminals and communications-oriented equipment, including data preparation equipment applicable to remote terminals.
- "Divestiture of the Service Bureau Corp. (SBC) and divorcement of IBM from the data services and time-sharing businesses.
- "Divorcement of IBM from the business of providing professional services, and education/training (other than providing those services associated directly with its computer sales), and divestiture of Science Research Associates (SRA).
- "Divestiture of IBM's Office Products Division and divorcement of IBM from the type of business conducted by that division."

In addition, CDC said there should be a court-issued mandatory injunction requiring the "mandatory use by IBM of higher order languages, and mandatory disclosure of product specifications and design technology leading to hardware and software compatibility."

The memorandum also said a court should enjoin IBM from "unfair and predatory pricing practices, including (a) bundling, (b) hidden discounts, (c) discriminatory pricing, and (d) 'fighting machines,'" in addition to a prohibition against the marketing of "paper machines" on the part of IBM.

Policing Needed

"These measures of structural and injunctive relief must be coupled with a suitable means of policing," the memo continued, adding that "to enhance its effectiveness, the court decree should contain provisions permitting IBM competitors and customers to bring enforcement actions."

The CDC memo indicated "IBM's persisting market dominance is founded in its monopolistic share of the general-purpose computer market, certain IBM-induced structural charactcristics of the computer business that particularly entrench and magnify a dominant market share and IBM's exploitation of certain unfair market practices.

"In addition, IBM threatens to extend its domination of the computer market to the related markets of data services, professional services, education and remote terminals – all markets suited to effective competition among smaller companies," the memorandum stated.

Unless the government does something to dissipate the IBM dominance of the computer market, IBM will use that dominance as a springboard into these other markets, CDC contended, adding that in the past IBM used its dominance of the punched card market and the tabulating equipment market as a springboard for its monopolization of computer systems.

Therefore the Justice Department relief plan should aim at stopping IBM from getting a dominant share of these computer-related markets, CDC said, warning that if it did not do that it would probably have to sue IBM again in the future to break its control of these areas.

Boeing to Develop DP-Aided Master Manufacturing Plan

RENTON, Wash. – The Boeing Commercial Airplane Co. has received a contract from the U.S. Air Force to develop an Air Force Computer Aided Manufacturing master plan.

Boeing is soliciting information on existing computer-aided manufacturing plans from industry in order to evaluate them for possible incorporation into its project.

The plan could lead to cost reductions through automated planning, improved use of numerical control programming, computerized production control and other applications, while leading to beneficial developments in manufacturing technology, according to Harvey Buffum, program manager for Boeing

Series 70 Users Convert 'Faster Than Expected'

BLUE BELL, Pa. – Series 70 users are converting to Univaç equipment "at a faster rate than we expected," according to Aaron Henken, director of Univac's Series 70 operations.

A total of 15 Univac machines have been ordered or installed by Series 70 users, he said, including nine 1106s, two 1110s and four 9700s.

WE CALL THE 840 THE LOADED NOVA.

IT'S TOO BIG AND HAIRY TO BE A MINICOMPUTER.

By minicomputer standards, our new Nova 840 is big and hairy and costs a lot of money.

But, in terms of combined hardware/software performance, minicomputer standards just don't apply to the 840.

BIG HARDWARE

We loaded the 840 with a brand new Memory Management and Protection Unit that turns it into something far more than a minicomputer. MMPU lets the 840 grow to 128K 16-bit words (256K bytes) of main memory, and, most important, lets it take advantage of all the hairy software we've developed.

The 840 also comes with a whole list of peripherals and high-performance options, including a superfast new Floating Point Unit that handles single and double precision arithmetic at speeds that match most big computers.

HAIRY SOFTWARE

But hardware is only the vehicle. What makes the 840 a different kind of machine is software: the most powerful software available with any computer at anywhere near its price. Proven software we can deliver today.

It has a Real-time Disc Operating System that supervises the whole system; our new Fortran 5, that produces globally optimized, fast-executing code that's as efficient as machine language; Batch; remote job entry software; timesharing BASIC; and Extended Algol.

Dual Operations on the 840 lets you run any two major software streams concurrently and with complete security: multi-terminal timesharing BASIC along with remote job entry, or a real-time control application while you're doing prototype development in Algol.

THE PROOF

With all that hardware/software muscle, the 840 has embarrassed a lot of far bigger computers in price/performance benchmark comparisons.

For instance, there was the XDS Sigma 7 that was 40% faster running an independently conducted Fortran benchmark. And then got wiped out by the 840's more-than 10-to-1 price advantage.

Or the DECsystem-1050 that cost eight times more than the 840. And was actually 7% slower running the benchmark.

If you think those benchmarks are too good to be true, just call us. We'd love the chance to give you a lot more details on the benchmarks and how Data General software makes that kind of price/performance possible.

THE PAYOFF

We know that Data General isn't the only minicomputer company with a big hairy machine.

We also know that the 840 is, capability-for-capability, feature-for-feature, consistently less expensive than the competition.

And we know we can deliver the 840 faster than the competition can deliver their machines: 90 days after you call us with an order. (617) 485-9100.

Japanese Bank Buys 5 NCR 350s

DAYTON, Ohio – NCR has received a purchase order for five Century 350 multiprocessing systems, valued at $23 million, from the Sumitomo Bank.

Initial installations of the equipment will be at the bank's Osaka data center, followed by installations at the Tokyo data center.

The 350s will eventually replace the 12 NCR 315 rod memory computers currently used by the bank for on-line processing. Each 350 has approximately the same processing power as three Century 300s, NCR said.

Last year the bank placed in operation four Century 300s.

The Sumitomo on-line system also uses over 1,500 NCR data terminals to capture data from demand deposit, time deposit and savings account transactions at bank tellers' windows throughout Japan.

STC Protests Award by Georgia to IBM

ATLANTA – Storage Technology Corp. (STC) is protesting an award by the State of Georgia to IBM for 10 tape drives, alleging the award was made for political reasons.

An STC spokesman said a letter of intent was given to IBM as "a political decision." He said he has been informed that the contract had been awarded on the basis of policies rather than performance and economics.

STC bid $150,000 which, according to published list prices, is lower than the IBM award, estimated to be about $175,000.

Georgia has a policy of awarding to the "lowest and best bidder," noted Jerry O'Neil, commissioner of administrative services.

"We are prepared to defend our decision," he said, noting that the state is experiencing "operational problems" in the Department of Revenue DP center with some non-IBM equipment, and "based on our extensive evaluation, the best interest of the state would be served by going with the vendor (IBM)," he said.

"I have in no way changed my policy on open competition for procurements," he asserted. "I don't think anyone can demonstrate that."

O'Neil plans to reply to the protest, and said any future action would be up to STC.

The Department of Revenue has an IBM 370/145 running on CICS/DOS for income tax applications. The 10 IBM 3740-5 tape drives ordered, scheduled to be installed within the month, are replacements for Telex drives.

The center rewrote its income tax application and installed the 370 in July 1972, he said. The on-line tax system has been run once.

"We got through it, but not very gracefully," said Dr. Brett Williams, director of the division of information and computer services. "We're hoping to do a considerably better job this year," he added.

"Under those circumstances we felt that at this point in time we'd be better off not to inject any more uncertainties into that system than we had to," Williams added.

"It's mostly a case right now of when problems do occur, of minimizing the number of possibilities," Williams said.

"We're not a sole source shop by any means. We have a great deal of non-IBM equipment, including third-party leased 65s from Itel, some Itel 7330s, and Memorex gear.

DATA GENERAL
Southboro, Massachusetts 01772

Commerce Forecasts German DP Growth

(Continued from Page 35)

with sales accounting for as much as 65% of the German peripheral market in 1977.

CRT inquiry/response terminals, data collection terminals, teletypewriter and terminals that can be used in batch modes will share in the rising sales.

In addition, demand for key-to-disk/tape systems and storage devices should also be strong, the report found.

Less than 16% of the computers now in use were purchased; most are on one-year leases, the report said.

Despite the volume of equipment on lease, only 2% of the base, excluding minis, is through independent leasing companies.

For minis and other less expensive equipment, whose manufacturers may not have the financial resources to offer leasing, the share of equipment on independent lease is much higher, the report said.

Tariffs on DP equipment from the U.S. range from 5.5% to 7%, with an 11% turnover tax levied on all imports to compensate for the value-added tax paid by domestic makers.

However, the report pointed out, equipment purchased by universities for purposes that are "essentially in the interest of science," and purchases by other nonprofit institutions for education and training purposes, are exempt from duty, provided no comparable domestically produced devices are available, the report noted.

Stiff Competition

Competition in the German market is becoming increasingly intense as more firms enter the arena. Of the 34 firms engaged in the manufacture of DP equipment in Germany, nine are foreign-owned, eight by U.S. companies and one by Philips.

Siemens A/G, with 20% of current DP sales, leads Telefunken Computer GmbH and Nixdorf Computer A/G.

Siemens computers are said to account for 16% of the installed base in Germany. Sales reached $299 million in fiscal 1972. About 30% of the firm's production is exported, the report noted.

Telefunken Computer GmbH, with its specialization in large computers, especially those suited for technical and scientific applications, reported sales of $33 million in fiscal 1972.

Nixdorf Computer A/G, Germany's leading maker of small computers for commercial applications, forecast sales at $126 million. About 30% of its German production is exported, the Commerce Department said.

The report lists BASF as the nation's leading independent manufacturer of peripherals, and noted the firm's sales in the area have grown from about $1.6 million in 1966 to more than $31 million in 1971. Nearly 50% of its production is exported, it said.

Among large suppliers of imported computers and equipment, France is second, with 14% of the import market in 1972, followed by Great Britain, 12%, Italy, 10%. Canada, Israel, Sweden, Japan and Denmark also supply DP equipment to Germany.

IF YOU'RE NOT LOOKING FOR A NEW JOB, WE'RE LOOKING FOR YOU...

SEARCH

to invite you into our inner circle. Of information scientists . . . data processing professionals in all disciplines . . . management people . . . who are proven achievers. Especially if you're happy and contented where you are. Then you're a prime candidate for SEARCH.

Object: to make a match
SEARCH is getting to know you. Fully. Your work. Your background. Your personal chemistry. Your aspirations and inclinations. SEARCH is also a remembering process. For the time a client asks us to find a person just like you. To fill a position that just matches you. Then we present all the facts about the job for your consideration. Facts which make the change good business sense.

We're a unique organization . . .
Of computermen who are also personnel scientists. Consultants to major corporations for targeted recruitment, career development, and compensation planning. Who retain us . . . and pay all the fees . . . for our SEARCH program.

Build something for yourself
Get in touch with us, so that we can get to know each other. Confidentially, of course. And help you get to know as much about the prospective job and company as the client gets to know about you, all in an equal opportunity environment. Or, send for our new SEARCH brochure to get the whole story.

THE BERTON GROUP INC.
Gulf and Western Building
15 Columbus Circle
New York, N.Y. 10023
(212) 489-9858
Personnel science consultants
to the data processing community

IBM Hiring Up

WHITE PLAINS, N.Y. – IBM will increase its number of employees this year for the first time in several years, and is closing the New York Development Center, a firm spokesman said recently.

The firm intends to hire about 10,000 persons domestically this year, a spokesman said, noting that in 1970-71 the firm had a policy of limited hiring and reduced its staff through normal attrition. The employment situation stabilized in 1972, he said.

The phaseout of the New York Development Center is planned for the spring and summer of 1974, as it is being consolidated with related programming efforts in Kingston, N.Y., Palo Alto, and San Jose, Calif.

By Former Employee

IBM Sued for $1 Billion

DENVER – Marihelen Jones, an IBM employee for 11 years, is suing IBM for a total of $1 billion. The suit, intended as a class action, contains two clauses, one on a breach of contract and the other on tort cause.

The suit claims the implied unilateral contract between employer and employee was illegally severed by IBM's actions and that IBM's "outrageous behavior in fabricating supposed shortcomings . . . and in creating goals which were unobtainable, inflicted, as was (IBM's) intention, severe emotional distress upon (Jones) . . . ."

Jones is seeking damages of $500 million for herself and others in the same class and an additional $500 million in punitive damages as well as court costs and legal fees.

An IBM spokesman said: "We have examined her claims extensively and concluded that her suit is clearly without merit, and accordingly we've asked the court to dismiss the suit."

Jones claimed her ratings over the years had gone from "far exceeding expectations" to "consistently exceeded expectations" to "unsatisfactory."

She alleged she has been unable to discover any legitimate reason for the drop in ratings except for the purpose of forcing her to resign from IBM. This, a spokesman said, was further evidenced by a performance plan given her before she left IBM "under duress" that was patently impossible to achieve in the time provided." She retired in April from her position as advisory marketing service representative.

Jones charged IBM's planned attrition was responsible for her termination.

"The thing that we hope to establish was that this segment of IBM's business was in essence falling off rather badly, and she'd been diverted into this area of sales where conditions were already bad with the thought that of course, she wouldn't be able to perform anyway," attorney Dale Speigel said.

Commenting on the amount of the suit, he said considering that IBM has about a million employees "we don't know the number of employees that have been wrongfully severed in the same manner."

Social Security Orders Laser Memory

BALTIMORE – The Social Security Administration's Woodlawn Complex here has ordered a System 190 Laser Mass Memory from Precision Instrument Co. The system, scheduled for delivery in April, will have a capacity of 66 billion bits. It will be linked with a Univac 1108.

This will be the first installation by Precision Data to use this laser technology in a business DP environment, the firm said.

Orders & Installations

Interstate Drug Exchange, Plainview, L.I., has ordered a Univac 9480 system for inventory control and demand forecasting.

Nebraska Methodist Hospital is installing the Technicon Medical Information System. The system will be operated on the hospital's IBM 370/145 and will include 30 printers and 45 CRT terminals.

U.S. Army Electronics Command, Fort Monmouth, N.J., has ordered two Model 70 minicomputer systems from Interdata, Inc. for use in experiments involving automated tactical surveillance and target acquisition.

COMPUTER ENGINEERS

This move – to NCR San Diego – may be your last!

The combination of NCR and San Diego means a career without compromise. Here you can create your own lifestyle – by the sea, on a hilltop, in a country club condominium. You can camp, fish, swim, boat, picnic and hike practically in your own back yard . . . and play gold year-round on any of 65 local courses. You can enjoy 70 miles of beaches reaching from San Clemente to the Mexican border . . . study in your choice of major colleges and universities . . . take part in the rich cultural, artistic, musical and theatrical life of one of California's most sophisticated urban centers. The career part is even better. You'll be working in one of the nation's most progressive digital computer systems facilities, and you'll move ahead as fast as your abilities permit.

CIRCUIT DESIGN ENGINEERS

For challenging state-of-the-art assignments in some or all of the following disciplines: switching, circuit design, analog circuit design, integrated circuits, network analysis, transmission lines, noise investigations. Requires BSEE with 2-5 years' experience.

HARDWARE DIAGNOSTIC ENGINEERS

Work involves creative use of existing computer logic to isolate faults to board or component levels in automatic diagnosis of manfunctions in central processing units, peripheral units and on-line systems. Specific activities include writing test outlines; coding, debugging and documenting programs. Positions require degree in computer science or electronic engineering plus 2-5 years' applicable experience and familiarity with both hardware and software.

SYSTEMS LOGIC DESIGN ENGINEERS

Immediate requirements for electronic development engineers to work on the following projects:

Coordinate the design of micro-programmable processors. Perform unit and system-level design, debugging and evaluation of engineering models. BSEE with computer science courses and 5 years' experience in CPU logic design and testing.

Perform logic design of peripheral controller using state-of-the-art components including TTL, MSI, ECL and ROM. Supervise construction test and documentation of prototype units. BSEE with 4 or more years' experience in logic design.

Perform memory system logic design to include memory-to-CPU interface logic design and hardware implementation. Should be knowledgeable in the latest memory technology, including semiconductor storage devices. Requires BSEE with 2-5 years' experience.

Employee with enjoy excellent salary and top working conditions with a non-defense employer. Fully paid life, hospital and medical plan for employees and dependents. Full travel and relocation allowance.

To arrange a confidential interview

please send a resume, including training experience and salary history, to the Professional Placement Office at the address below.

NCR
Data Processing Division
16575 W. Bernardo Drive, San Diego, Calif. 92127
An Equal Opportunity Employer

'74 Reserved NCC Space Bigger

CHICAGO – Exhibit space reserved for the 1974 National Computer Conference already exceeds total space utilized at the 1973 NCC. Over 120 companies have booked more than 640 booths, according to the American Federation of Information Processing Societies (Afips), conference sponsor.

The conference, to be held in McCormick Place here May 6-10, is expected to have 300 exhibitors occupying more than 800 booths, Afips said.

The 1974 NCC will cover the full spectrum of computer applications and interests, officials said, with every major segment of the industry represented – from minicomputers to mainframes, packaged programs to peripherals and CRTs to communications equipment. AT&T, Burroughs, Control Data Corp., Data General, Digital Equipment Corp., Hewlett-Packard, IBM and Tektronix have already reserved space.

"We are off to a running start. The enthusiasm of prospective exhibitors is very high," conference manager Gerald van Dijk said.

Afips is at 210 Summit Ave., Montvale, N.J. 07645.

Social Security Leases Scanner From REI for Form 941 Documents

DALLAS – The U.S. Social Security Administration has ordered a multifont page-reading system from Recognition Equipment, Inc. (REI) to process its form 941 documents.

The system, a specially configured Input 80, will be leased from REI.

Shipment to the administration's Baltimore headquarters is planned for the first half of 1974.

Forms 941 and 941-A are submitted by employers throughout the country and contain employees' names, Social Security numbers, taxable Fica wages, tips and employer's identification number. This data will be read by the Input 80 and transferred to magnetic tape.

REI has contracted to manufacture the Input 80 with a vocabulary of 560 character patterns. The system will be designed to read upper- and lowercase characters and single-spaced lines.

Data 100 Increasing Lease Base By Purchasing Units From Pepsico

MINNEAPOLIS – Data 100 Corp. is adding to its lease portfolio through the purchase of its terminals previously sold to subsidiaries of Pepsico, Inc.

The agreement with Pepsico, valued at about $10.5 million, calls for payment of about $9.5 million in cash plus 85,000 shares of Data 100 common.

The gross margin in company-owned terminals is considerably better than on equipment sold with full recourse to finance companies, Data 100 President Edward D. Orenstein noted.

"We're now in a position where we can buy back the equipment and obtain the full long-term benefits which accrue when a company leases its own equipment directly to its customers; we won't have to share future rental income on this equipment with a third party," he said.

The purchase from Pepsico is being financed through additional bank borrowings.

"By adding Data 100 terminals with a current new equipment list price of about $17 million to our lease pool, we are accelerating our ability to build potential long-term profits without diluting current earnings," Orenstein said. "In addition, we are simplifying the administration of our lease portfolio."

The move is the final step of a program started in mid-1972 when Data 100 stopped selling its equipment to leasing companies under recourse contracts of this type, the company said.

Executive Corner

■ Nathan Snyder, former executive vice-president of Randolph Computer Corp., has been appointed president and director of Bancal Leasing Co., a newly acquired subsidiary of Bancal Tri-State Corp.

■ Truman F. Rice has been elected president of the computer leasing division of James Talcott, Inc.

■ Ronald G. Citterberg and Alfred D. Keener have been appointed vice-presidents of Compu-Serv Network, Inc.

■ Paul C. Nee has been named vice-president of corporate planning for Cambridge Memories, Inc.

■ Gary F. Rea has been elected second vice-president of Data Information Science Center (Disc).

■ Arnold M. Spielberg has been appointed to the new position of director, engineering, for Burroughs Corp. He will be responsible for coordinating and monitoring the engineering programs of the Computer Systems Group.

■ Bernard Hathaway has been appointed vice-president, manufacturing operations, at Computer Transmission Corp.

■ Allen F. Rousseau has been named vice-president, customer operations, for Keydata Corp. Robert M. Bienkowski has been elected vice-president, technical operations, succeeding Rousseau.

■ F. Donald Ventura has joined Cambridge Memories, Inc. as vice-president, marketing.

■ Charles T. Masters has been named vice-president, marketing, for Ramtek Corp.

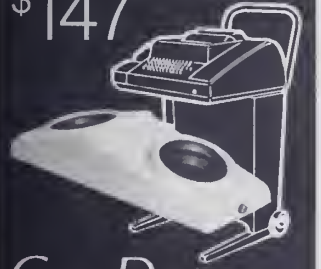
■ Anthony A. Barnett has been named senior vice-president, information systems, for Bunker-Ramo.

■ David Martin and Joseph Trombadore have been elected vice-presidents of Advanced Memory Systems, Inc. Martin will serve as vice-president, end-user marketing, while Trombadore is the new vice-president, systems manufacturing.

1973 COMPUTER INDEX

DP INDEX-73 All new guide to Greater S.F. Bay Area computers. The best info. available on 1000 computers at 600 sites. All verified in the last 3 months. Name, Address, Phone, DP Mgr., Computers, Peripherals. Use Computer Index to find Mfr. & Model. City Index lists sites by Area. Send $30 check or PO to:

DP Index Company
999 Commercial St.
Palo Alto, Calif. 94303



LOW-PRICED
acoustic coupler
MODEL 150 . . . NO FRILLS

- For use with all Series 33 TELETYPE Terminals.
- Half/full duplex switch.
- Carrier indicator.

$147

ComData member of IDCMA
7544 West Oakton Street
Niles, Illinois 60648
Phone: 312/692-6107

We need an Automated Averaging Program

Sterling Recreation Organization Co. is very interested in purchasing a proven automated league score averaging program that meets these criteria:

- Compatible with a Honeywell 115 computer
- Written in COBOL
- Operates with a 24 K memory
- Operates in disc or tape mode
- Provides positive bowler identification
- Provides full averaging service for over 13,000 league bowlers in accordance with ABC, WIBC requirements as described in Rule 102E - WIBC 1973-74 rules

Write or Phone George Cumming
P. O. Box 1723 Bellevue, Wa. 98009 (206) 455-8100

POSITION ANNOUNCEMENTS

Position Announcements

SYSTEMS ANALYSTS AND PROGRAMMERS

A growing computer service company is seeking both experienced systems analysts and programmers who desire the challenge of working on varied applications with client companies. You would be a member of a small team of experienced professionals designing and implementing major manufacturing or financial systems.

Systems Analysts – degree required, programming experience helpful. Programmers – 360 COBOL required, assembler experience would be a plus. Excellent salary/company benefits.

Send resume, including references to: M.S. Michalec, VP

ARISTA INFORMATION
SYSTEMS, INC.
P.O. Box 4775
Winston-Salem, N.C. 27107

CONTROLLER AND
DATA PROCESSING MANAGER

Dynamic company has unusual opening for "people-oriented" manager. This person will head accounting and data processing sections as well as do programming. Our IBM System 3 data processing is highly innovative. We also have rapidly growing computer service bureau for other area firms. Accounting and extensive data processing a must. Delightful small town living, excellent working conditions, many fringe benefits. Salary $16,000 per year. This is an excellent opportunity.

Write: Personnel Manager
Liberty Petroleum Co., Inc.
P.O. Box 1209
Mt. Vernon, Illinois 62864

All inquiries will be kept confidential.

SEATTLE POSITIONS

Keep your career moving — in the beautiful Pacific Northwest. Consider joining our particularly successful firm in a multi S/370 environment utilizing IMS, TSO, etc. for the development of leading edge applications. Excellent working conditions and benefits with challenging work as the focal point.

We will consider people, for additions to our staff, who have 2 or more years experience as a Programmer, Programmer-Analyst or Systems Analyst. We would prefer individuals with some connection to the Northwest.

Please contact Mr. James Borden, Personnel Department, (206) 545-5646

SAFECO INSURANCE
Safeco Plaza
Seattle, Washington
98185

an equal opportunity employer

Programmer Analyst

Assist a Ph.D Research Analyst in the design and development of a large data base involving educational research projects. Duties include the operation of OMR and other peripheral devices in an IBM 360/30 DOS installation. Programming activity extends from programs to maintain the data base to programs for statistical analysis and reporting of data.

Bachelors degree in an appropriate field which includes course work in statistical methods, experimental design, and data structures. A thorough working knowledge of Fortran is essential. Some familiarity with RPG is helpful.

$9,000 to $10,000 depending on experience. Appointment is for 1973-74 school year only and is not renewable.

Send resume to:

Dr. Robert K. Wysocki, Director
Academic Computer Center
Northeast Louisiana University
Monroe, LA 71201

PROGRAMMERS
SYSTEMS ANALYSTS
MS
OS INTERNALS
CICS
TELEPROCESSING
BUSINESS APPLICATIONS

We are in need of experienced computer professionals with 1-5 years experience in a systems software or business applications environment. Experience in ALC, COBOL, or PL/I is mandatory. Positions are available for junior, intermediate, and senior level analysts and programmers. For immediate consideration send confidential resume with salary history to:

Tom Maltby
(301) 948-6620
JDG Associates, Ltd.
2351 Shadey Grove Road, Sutie 107
Rockville, Md. 20850

Computerworld Sales Offices

Vice President—Sales: Neal Wilder. **Sales Administrator:** Dottie Travis. Computerworld, 797 Washington St., Newton, Mass. 02160. Tel: (617) 332-5606.

Northern Regional Manager: Robert Ziegel. **Account Manager:** Mike Burman. Computerworld, 797 Washington St., Newton, Mass. 02160. Tel: (617) 332-5606.

Eastern Regional Manager: Donald E. Fagan. **Account Manager:** Frank Gallo. Computerworld, Suite 1511, 225 W. 34th St., New York, N.Y. 10001. Tel: (212) 594-5644.

Los Angeles Area: Bob Byrne. Robert Byrne & Assoc., 1541 Westwood Blvd., Los Angeles, Calif. 90024. Tel: (213) 477-4208.

San Francisco Area: Bill Healey. Thompson/Healey Assoc., 1111 Hearst Bldg., San Francisco, Calif. 94103. Tel: (415) 362-8547.

THE HEBREW UNIVERSITY COMPUTATION CENTER

is seeking a

DIRECTOR OF SYSTEMS PROGRAMMING

Task consists of organization, development and management of the operating system group. Maintenance and development of software for a multi-mainframe CDC 6400/CYBER 74 configuration.

Qualifications: University Degree in Computer Science or equivalent education; 5 years systems programming experience; extensive knowledge of CDC 6000 series system; wide experience of system operation and programming; project management experience. Knowledge of Hebrew language is desirable.

Send detailed Resume and Recommendations to.

Personnel Department Post 53/73
The Hebrew University
Jerusalem, Israel
Before: October 15, 1973

SYSTEMS/TECHNICAL SUPPORT SPECIALISTS

Outstanding Career Opportunity

We are a well-financed, rapidly expanding affiliate of a Fortune 500 company. We offer an extremely interesting, challenging, stable and financially rewarding career for systems and technical support specialists.

We are looking for several rare individuals who have experience in each of the following areas:

1. Technical Marketing Support — direct customer interface, assisting sales personnel.
2. Communications Hardware experience.
3. Communications and File Maintenance software experience — BTAM, QTAM, IMS, CICS, and/or T/P monitors.
4. Mini-Computer experience a plus.

Unfortunately only those resumes which clearly indicate the degree of experience in each of these areas can be considered. Please write in strict confidence, including employment experience and salary history to:

PERSONNEL DEPARTMENT
CW Box 3922
797 Washington St.
Newton, Mass. 02160
An Equal Opportunity Employer M/F

Salesmen & Sales Manager

Data Communications

Intertel has had a successful, profit-making history in the OEM market. Now we're making an aggressive move into the end-user business. That means lots of hard work and a good chance to make a lot of money.

You'll sell data communication network management systems (including modems, diagnostic equipment, and network configuration hardware) to Fortune 1000 companies, major banks, airlines, etc.

There are openings for sales engineers in Chicago, Detroit, Pittsburgh, and metro New York, and for a Midwest sales manager.

For the manager slot, we must have someone with experience running a district or regional operation.

Call our national sales manager, Neal Dempsey, at (617) 272-7030.

Intertel is an equal opportunity employer.

intertel

6 VINE BROOK PARK, BURLINGTON, MASSACHUSETTS 01803

MINI-COMPUTER EXPERIENCE PROGRAMMERS

Opportunities for programmers with 1-4 years mini-computer experience to develop real-time systems for use in a public safety environment. Openings exist in system, hardware diagnostic and application programming.

FIELD ENGINEERS AND TECHNICIANS

Opportunities are also open for field engineers and field technicians with 1-3 years mini-computer experience. These positions will involve the installation and maintenance of minicomputer systems. Data communications experience is desirable.

If you want challenging work and moderate travel with liberal company benefits in the exciting area of public safety, contact:

Thomas Price, Systems Manager
Kustom Electronics, Inc.
1010 West Chestnut
Chanute, Kansas 66720
(316) 431-4380 Extension 271
An Equal Opportunity Employer m/f

Join us near Austin, Texas

Clean air, Beautiful lakes, Rolling Hills
and easy access to a metropolitan area

If you are a PROGRAMMER/ANALYST

We can use your talents at our exciting, modern

WESTINGHOUSE
Gas Turbine Systems Plant

Our brand new facility is now in operation. We believe It's the kind of working environment you might be looking for.

A University and State Government center, Central Texas also has vast expanses of natural beauty. It's a good place to bring up a family. And you might be Interested in the cost of living figures of this area.

This is what we're looking for:

- **Four years in System Design & Programming**
- **Knowledge of Cobol**
- **Manufacturing Systems experience preferable**
- **College Degree**

Write us about our liberal benefits program. It includes payment of your moving expenses.

Call or write for an application:
Mr. Tom Doggett
Westinghouse Employment Department
Box 277
Round Rock, Texas 78664
(512) 255-4141
An Equal Opportunity Employer M/F

Sell Europe's largest EDP market this November.

The Computer Caravan is a travelling computer users' forum and exposition that has created a whole new form of EDP marketplace, with a proven record of success. Two U. S. Caravans have produced a total attendance in excess of 50,000, and a remarkable sales record. Now we're going to Europe–starting with a four-city English Caravan in September, and a five-city German Caravan in November. Next spring, we'll follow with a French Caravan.

But we're not simply taking our American ideas and customs abroad. We know that the needs of EDP users differ from country to country, and we've arranged for local sponsorship and guidance for each European Caravan.

In Germany, a leading EDP marketing organization, AMS Market Services, will be in charge of Exhibit Management and Sales. Dr. Gerhard Maurer, a widely respected EDP expert, will manage our Forums; and promotional support will be provided through leading EDP trade publications.

Germany is Europe's largest EDP market, and the German Computer Caravan is a unique, new way for your company to increase its sales there. To get a free brochure, just send in the coupon below. We'll send out the details right away.

The German Computer Caravan Schedule

Dusseldorf......	Nov. 1-Nov. 3
Hamburg.......	Nov. 6-Nov. 8
Frankfurt.......	Nov. 13-Nov. 15
Berlin..........	Nov. 20-Nov. 22
Munich........	Nov. 27-Nov. 30

TO: Neal Wilder
Vice President, Marketing
Computerworld
797 Washington Street
Newton, Mass. 02160
(617) 332-5606

Please send me further details on the European Computer Caravans.

Name__________
Title __________
Company __________
Address __________
City __________State __________Zip __________

The European Computer Caravans sponsored by COMPUTERWORLD

Over 50,000 qualified paid subscribers read Computerworld each week.

Who's Leslie, Kavanagh?

Leslie, Kavanagh. A name that stands for professionalism and results in executive search and consulting for the EDP profession. A name to consider if you wish to maximize career growth in the EDP field. Leslie, Kavanagh: staffed by experienced professionals who specialize in placing the "best with the best" — the best applicants with the finest corporations in the United States. No matter how varied your professional interests or background, the odds are Leslie, Kavanagh can help you in achieving career goals.

Leslie, Kavanagh. A name to associate with integrity and honest, straightforward answers. If we can't help you, we tell you so . . . right off. We're here to serve you, not waste your time. But to really find out what's behind "the name," call Executive Vice President at (212) 661-0670. Or write to him at Leslie, Kavanagh Inc., 505 Fifth Avenue, New York, New York 10017.

LESLIE, KAVANAGH INC.

Speciolists in EDP Professionol Seorch

AGENTS WANTED

We need sales representation in several locations in the U.S.A., Canada and Mexico by agents who are willing to guarantee results. Two of our major software products, WORK TEN, a COBOL generative language and RSVP, a user oriented report retrieval system, are presently installed in over 150 locations worldwide. Plenty of excellent references available. Send qualifications and requests for information to:

Frank U. Beck
NCI, Inc.
6075 Roswell Road
Atlanta, Georgia 30328

SYSTEMS Senior Systems Programmer/Analyst

Excellent opportunity with top Fortune 500 company. We require an individual with 4-6 years experience in programming and systems which includes at least 3 years in communications systems. Must also be experienced in analyzing and adapting communications software packages. Knowledge of CICS and assembler required.

We offer a fine starting salary, excellent fringes and the opportunity to contribute to and partake in our phenomenal growth. Send resume & salary requirements to: CW Box 3919
797 Washington St.
Newton, Mass. 02160

Our continued remarkable growth creates openings in . . .

MANAGEMENT INFORMATION SYSTEMS

Burger King has scored a solid success in the steadily expanding "Fast-Food" industry. These openings will appeal to the able energetic individual who seeks aprofessional career in data processing. Opportunities for advancement are excellent based on demonstrated performance and we are known for our progressive management policies.

Data Communications — Programmer/Analyst

Req: Cobol and Data Communications experience on Burroughs medium size equipment. At least one (1) assembly language on mini-computer (PDP-8). Good understanding of Data Communications Systems Design. Salary: 14-16,000.

Technical Specialist

Req: cobol, Fortran, Assembler and MCP experience on Burroughs medium Scale Systems. Desirable experience on/in Fortran, Reporter, NDL, general communications and business applications. Technical Internal Consultant on Burroughs Hardware and Software equipment. Salary $15,17,000.

Programmer (Distribution)

Req: Cobol (prefer Burroughs) and Documentation experience. One (1) Assembler language-preferably on Singer 10. Salary 11-13,000.

2 Programmers

Req: Cobol (Burroughs preferred) CRT background helpful. Experience in manufacturing areas a plus (i.e. Order entry, bill of material, etc.) Salary: 11-13,000.

Benefits are generous, including an outstanding major medical program, and company pays relocation expenses. Please send resume in confidence to:

BURGER KING®

John Lyon
Corporate Personnel Representative
Burger King Corporation
P.O. Box 783, Biscayne Annex
Miami, Florida 33152

Equal Opportunity Employer, M/F

OS SYSTEMS PROGRAMMER

Do you have large S/360 OS systems programming experience? . . . broad knowledge of HASP and/or ASP? We currently have dual mods 65's with upcoming 158 VS/65 environment and need sharp Systems Programmers to apply imaginative ideas to the area of software application.

. . . Great. We've got a job at the company's national headquarters in Tampa, Florida. The company is GTE Data Services. It's part of the General Telephone & Electronics Corporation family.

So, if you want to put your skills to work . . . and do it in a nice place . . . with all company-paid benefits . . . and chances to move ahead . . . send your resume to Mrs. Tannia Macias, Employment Representative, GTE Data Services Incorporated, P. O. Box 1548, Tampa, Florida 33601.

"AN EQUAL OPPORTUNITY EMPLOYER M/F"

GTE DATA SERVICES

EDP PROFESSIONALS CAREER GROWTH CHALLENGE IN CALIFORNIA

We have a growing list of staffing requirements ranging from Programmer/Analyst, Systems Analyst, Systems Programming, and Project Manager to President of a computer services company.

We are a firm which specializes in confidential recruiting of top professionals. Our client companies hire us to find the hard-to-find for positions which are not advertised. We have been in business since 1968 and have offices in San Francisco and Los Angeles. The members of our professional staff averaged fifteen years in the data processing field before joining our firm. Our experience encompasses all facets of data processing systems and software development, sales, services, and management.

We are not a resume-switching center. We must get to know you and understand your career plan to do an effective job for both you and our clients. If you plan to be in California, call or write to arrange a personal, confidential interview.

PROFESSIONALS FOR COMPUTING

465 California St., Suite 504, San Francisco 94104
(415) 956-7120
3345 Wilshire Blvd., Suite 210, Los Angeles 90010
(213) 380-2370

An Employer Retained Agency

Programmers

Build your future on a solid foundation

INTERDATA is a unique company specializing in general purpose mini-computers that do big jobs in a multiplicity of areas. We have been growing at the rate of about 50% a year, and we're still going strong. This, of course, means that those who join us now will participate in this growth. Although we are a well-established firm, we can still provide ground-floor opportunities that lead to bright careers. Our immediate needs include experienced System Programmers and Project Leaders in a variety of areas.

OPERATING SYSTEM DESIGN

These positions call for an intimate knowledge of real-time systems and file structures for the development of a state of the art operating system. An expertise in assembly language and programming experience are required. A background in FORTRAN and Mini-Computers is desirable.

COMPILER DESIGN

The responsibilities here include the design of new high-level language Compilers. The position also involves the design, maintenance, upgrading and enhancement of Compilers, Interpreters, etc. A complete knowledge of FORTRAN and other high level languages is a must, along with in-depth experience in assembly language and microprocessors.

PROJECT LEADER—DIAGNOSTICS

This position involves project responsibility for the design, implementation, debugging and documentation of various diagnostic and test programs. These are, primarily, for standard processors, memory systems and peripheral controllers. We require a background which includes proven project leadership plus a knowledge of assembly language, programming, computer hardware and microprogramming.

DATA COMMUNICATIONS

This is a Senior level position for someone to design and code assembly language programs for front-end Data Communications Systems. Knowledge of 360 BAL programming with some hardware test or diagnostic experience required. Also, a background in Mini-Computer communications applications in a systems environment is desired.

INTERDATA provides a host of advantages not the least of which is our Monmouth County location, a beautiful suburban environment which includes the "Jersey Shore". In addition we offer excellent salaries, a comprehensive benefits program, a truly professional atmosphere and, most important, the opportunity to build a bright future. Don't delay. If you qualify, come to INTERDATA...growth-oriented for the career minded.

Send your resume and salary requirements, in confidence to: Mr. Robert Cohen.

INTERDATA®

2 Crescent Place, Oceanport, New Jersey 07757

An Equal Opportunity Employer M F

PROJECT MANAGER

to $23,000

Our environment is large-scale OS/MVT with T/P. We are looking for a manager with strong systems architecture experience coupled with a good understanding of budgeting. The applications are similar to those of an inventory control system.

Please reply in confidence to:
Mr. Thomas P. Whelan
Manager of Systems Development
Synergetic Planning, Inc.
315 Montgomery St., Suite 1120
San Francisco, Calif. 94104
Or Call Collect:
(415) 788-8300

Assistant Director for Academic Computer Services

Duties: Coordination and setting up organization for all academic computing services including user services, consulting, application programming, documentation to supervision of student workers. Responsibilities will also include staff recruiting and coordination with the operation and administrative computer service staff as well as the University Computer Center staff in Amherst. Will report directly to the Director of Computer Services. Qualifications: Master's degree. Experience working in an academic computing environment, preferably with some supervisory or administrative level experience. Batch and time-sharing experience in various languages, (APL would be beneficial), experience on Control Data equipment preferred but not mandatory.

Resume, references, and salary history should be forwarded to Joseph Crick, Computer Facilities, University of Massachusetts, 100 Arlington St., Boston, Ma. 02116.

The University of Michigan — Dearborn

seeks a Director of Computer Services. General responsibilities to include planning, co-ordinating and administering newly developing computer facility. Desirable qualifications: Extensive knowledge of computer facilities, programs and procedures. Master's degree required, doctorate preferred. Five years experience in academic life including Instruction and or research. Demonstrated ability in administration. Please send resume including salary requirements to:

**The University of Michigan-Dearborn
Personnel Office
4901 Evergreen Road
Dearborn, Michigan 48128**

A non-discriminatory, affirmative action employer.

SYSTEMS Senior Systems Programmer/Analyst

Excellent opportunity with top Fortune 500 company. We require an individual with 4-6 years experience in programming and systems which includes at least 3 years in communications systems. Must also be experienced in analyzing and adapting communications software packages. Knowledge of CICS and assembler required.

We offer a fine starting salary, excellent fringes and the opportunity to contribute to and partake in our phenomenal growth.

Send resume & salary requirements to: CW Box 3919
797 Washington St.
Newton, Mass. 02160

Buy Sell Swap

SURPLUS

100 TAPE DRIVES

$1500 EA.

Units are Ampex TM-7 Read Only. Complete in desk height type cabinet. Various quantities of NRZ and PE configurations. Units sold as is — F.O.B. warehouse.

CW Box 3907
797 Washington St.
Newton, Mass. 02160

FOR SALE

Raytheon 703 Disc and Tape
Excellent condition
good price

Contact: Datronic Rental Corp.
Chicago, (312) 992-0760
L.A., (714) 521-9830
S.F., (415) 344-1131

Wanted to Buy

**Mini-Computer
for business applications.**

Minimum requirements. CPU — 16K core capable of handling 4 channel communications interface for interactive terminals; DISC DRIVE — 4K character disc storage CRT — 80 characters, 20 lines; PRINTER — Medium speed 100 lines per second.

Write P.O. Box 1056
Hawthorne, Calif. 90252
giving full details.
Please, do not call RxCount.

370/155

Available December
For Sale
or
Lease at 60% of IBM MAC
Principals Only
CW Box 3917
797 Washington Street
Newton, Mass. 02160

WANTED

TELETYPE® EQUIPMENT
New • Used • Parts
— ALSO —

- Data Terminals
- Peripherals
- Mini-Computers
- Modems

Contact us for data terminal sales, service, supplies and rentals.

TERMINAL SYSTEMS INC

11300 Hartland St.
N. Hollywood, Calif. 91605
213-769-6772 TWX 910-499-2675

we buy and sell

IBM Computer Systems
& Unit Record Machines
NCR 31-32-33-395-400
Burroughs - L Series

marion
84 Kennedy St.
Hackensack, N.J.
07601
(201) 343-4554

370/155
370/166

For Sale or Lease

October thru February Delivery

Call or Write
Tom Maddox
Comdisco, Inc.
2200 E. Devon Ave.
Des Plaines, Illinois 60018
(312) 297-3640

WE WANT TO BUY Teletype® Model's

28·33·35

Modems — Couplers — Other Data Communication Equipment

WE ALSO SELL THE ABOVE

Call or Write:
**DATA COMMUNICATION
EQUIPMENT BROKERS, INC.
1900 Thunderbird Street
Troy, Michigan 48084
(313) 689-2640**

SALE OR LEASE

402		$ 900
407-A1	M/A	$2900
403-A1	M/A	$1400
552	M/A	$1450
632-Mod 7	M/A	$2000
056	M/A	$ 350
024		$ 325
082		$ 900
514		$1100
Moore Burster w/Decol.		$650.00

COMPUTER PRODUCTS COMPANY
529 West Third St.
Cincinnati, Ohio 45202
(513) 721-3399

FOR LEASE BY OWNER

2030 F 2.0 MIC 65K
1403 N-1 1416 HN
1442 C/R/P
2841 2821-1
Available October 1, 1973
Excellent Terms Available
Don't Pass This One Up
Principals Only Contact:
CITIZENS FINANCIAL CORPORATION
(216) 692-1800 Mr. John Hall

FOR SALE - PDP8/I

PDP 8/1 with 20K Memory
Xebec Controller
2 CMD Dual Double
Density Drives
BD50 Interface
KW8IA Clock
Teletype and Interface

System Currently
Under DEC Maintenance
Ask For Joanne
(413) 781-6741

UNIVAC

Wanted
9300 12K, Card Reader and Punch
9200 Memory expansion, 8K to 16K
8414 Disc System
VI-C Subsystem for 1005 and 9200

For Sale
9200 8K, Card Reader and Punch
12,500.00
1001 Card Controller
700.00

The Arrangers
12805 Olson Memorial Hwy.
Minneapolis, Minnesota
(612) 546-9311

WANT TO PURCHASE USED

30 — Texas Instrument Silent 725 with Acoustic Coupler for European use. Give Features Available
1 — 1442 N-01
1 — 2501 B-01
1 — 2821 002
1 — 2321 001
1 — 2701 001 with Feats. 7698 — 8029

ALL ABOVE EQUIPMENT REQUIRED 30-45 DAYS
CW Box 3918
797 Washington St.
Newton, Mass. 02160

FOR SALE OR LEASE

024-$350; 026-$1300; 056-$250; 077-$550; 082-$1,000; 083-$2900; 085-$1800; 088-$5200; 402-$1300; 403-$1500; 407-$3500; 514-$1300; 519-$1600; 548-$2300; 552-$1500; 557-$3700; 602-$400; 2311 (1) $5000; 729 (5) $2500; 729 (6) $3000; 1448 (1) $1000; 1401 systems $17,500 & $35,000.

THOMAS COMPUTER CORP.
625 N. Michigan-Suite 500
Chicago, Ill. 60611
(312) 944-1401

32K 360/30 CPU

FOR SALE
1.5 us
One Selector Channel
Decimal Arithmetic
Floating Point
1051/1052

Immeidate Delivery, subject to prior sale or withdrawal

**$45,000
Full IBM maintenance**

tbi R
**TBI Equipment Div.
Time Brokers, Inc.
500 Executive Blvd.
Elmsford, N.Y. 10523
(914) 592-4065**

Nationwide broker/dealers of
DP equipment & computer time

Boston Chicago Elmsford N Y Los Angeles
New York City and Washington D C

Specialists in IBM 360/370

Purchase & Lease

- IBM 360/30 E or F or above any configuration
- 3—2311-011 $3,750
- IBM 370/155-J $15,900 per month

Wanted IBM 360-20 CI

For information on the EDP equipment exchange service contact:
Gary Johnston

**American Computer Exchange
24500 Chagrin Blvd.
Beachwood, Ohio 44122
(216) 464-3881**

For Sale

All or by compoents NCR 200
128K Thermo printer
I/O writer
6209 — Multi-programming
6212 — Octaplex
6211 two high speed trunks
6207-console debug
6215-interval timer
6213 — 315 compatibility
627 — 315 emulator
Available November 1
write D.P. Manager
P.O. Box 19148
Kansas City, Missouri 64141

We Need:

1419
MOD 1

BUY
SELL
LEASE

FOR
BETTER
VALUE
LOOK TO:

Available:

360/50-512K
360/40-64K
360/40-128K
360/40-196K
360/30-32/64K

cac
COMPUTER ACQUISITIONS COMPANY
P.O. Box 80512, Atlanta, Ga. 30341 (404) 458-4425
Strathmore Office Bldg. Highway 42
Matawan, N.J. 07747 (201) 566-8924

HONEYWELL up to 90% OFF

20KC, 44KC & 64KC TAPE DRIVES
MEMORY, DISK DRIVES, CARD I/O
H1250 SYSTEMS
32K to 112K CPUS, CARD I/O
650 LPM PRINTER
AND UP TO (8) 44KC TAPE DRIVES

H115-2 SYSTEM
32K CPU, CARD I/O, 1100 LPM PRINTER
And 172 DISK DRIVES

Call: (617) 261-1100

We BUY Any Computer Peripheral or Teletype
Send For FREE Price List
AMERICAN USED COMPUTER CORPORATION
P.O. Box 68, Kenmore Station, Boston, Mass. 02215

WHO IS... The Major Financial Institution Leasing S/360's And S/370's in the U.S. Today?

First National Boston (FNB) a top-ranking international financial institution with assets of over $6.3 billion, is now leasing IBM S/360 and S/370 computers and peripherals through an FNB affiliate, Randolph Computer Company. FNB's entry into computer leasing now provides the solid financial base required for highly flexible short and long-term computer leasing of IBM computers and peripherals by IBM users.

During 1972, leasing of S/360 and S/370 CPUs and peripherals saved Randolph's computer-leasing customers over $22 million in rentals . . . in just one year. These users of Randolph's computers, who number over 200, are distributed across all of the 12 major U.S. industry sectors, with small firms as well as large corporations sharing in cost-saving leases from Randolph. Financial institutions, too — the professional money managers — are well represented among the EDP users who analyzed financial alternatives, then selected the most flexible lease plan for them: a plan designed by RCC for their changing needs.

For your up-to-date lease plan, contact RANDOLPH, THE COMPUTER LEASING COMPANY, now:

RCC
- 537 Steamboat Rd., Greenwich, CT, 06830 (203) 661-4200
- 8060 Montgomery Rd., Cincinnati, OH, 45236 (513) 793-6060
- 530 "B" St., San Diego, CA, 92101 (714) 232-6401

MAGNETIC TAPE

1600 BPI	800 BPI recerti-fied	uncerti-fied
2400	$6.00	$3.50
1200	5.00	3.00
seals	thinline	thickline
IBM	Memorex	Scotch

released from
GEOPHYSICAL Archives
not work tapes
(713) 772-5557
C.A.R.D.
7575 Bellaire Blvd.
Houston, Texas 77036

DISK PACKS WANTED

ALL TYPES ALL MANUFACTURERS

We also sell and lease new and recertified disk packs.

Used Computers, Inc.
14 S. Bryn Mawr Ave.
Bryn Mawr, Pa. 19010
(215) 525-4456

BEFORE YOU BUY BEFORE YOU SELL GO GREYHOUND

WANTED
360/65's 360/50's

FOR SALE
2030F (1.5 Mic), 2040G, I/O Set, 2314-1. 2314-1's, 1012 Tape Punch.

A member of the Computer Lessors Association

CALL OR WRITE: Director — Equipment Sales
Greyhound Computer Corporation
Greyhound Towers
Phoenix, Arizona 85077 Phone 602) 248-5972

---

buy • sell • lease • trade

360/370

dataservequipment inc.

Call Collect 612–546-4422
Or Write .... 400 Shelard Plaza, Suite 415
Minneapolis, Minnesota 55426

BUY • SELL • LEASE 360/370

AVAILABLE IMMEDIATELY

special prices for quick delivery

360/30	360/40	360/50
32K, 64K	64K, 128K, 256K	128K, 256K

CPU only or complete system with 1/0 sets

360/20		360/65
8K SYSTEM	30 DAY DELIVERY	2860-3 2870-1

2420-7s 2401-5s 2401-1s 2314-1

THE WORLD'S LARGEST IBM 360/370 DEALER

Comdisco Inc.

2200 E. Devon Ave., Des Plaines, Ill. 60018
Telephone 312-297-3640 • TWX 910-233-2478

TURN COMPUTERWORLD UPSIDE DOWN
FOR THE BEST 360 BUY

FOR LEASE OR SALE

360 - 30 - F - 15405
1051- N1 - 51582
1052- 6 - 61620

360 - 30 - F - 16294
1051- N1 - 52530
1052- 6 - 66350
2821- 01 - 16174
2540- 01 - 11789
1403- N1 - 36799

1401- E5 - Tape & Disk System
1401- C6 - Tape System

029 - B-22's

059 - 02

Sale- 1316- Disk Packs- $20.00	Lease- $4.00 Month
Sale- 2315- Disk Packs- $35.00	Lease- $5.00 Month
Sale- 2316- Disk Packs- $75.00	Lease- $7.50 Month

WANTED

360 - 20 - Card System

557's	1403-N1
088's	2540-01
129's	2821-01

DATA AUTOMATION SERVICES, INC.
4858 Cash Road
Dallas, Texas 75247
(214) 637-6570

SALE/LEASE

360/20's

C1-8K, 1403-7, 2560 A-1
D2-16K, 1442-5, 2501 A-1 — 1403-2
(2) 2311-11, 2415-1
OTHER MODELS AVAILABLE
1401 C 3, 1402-1, 1403-2
360/30's, 40's, 50's with I/O sets
370-145's, 155's

BUY

All model 360/20's, 360/30's,
40's, 50's and 65's
370's and System 3's
All peripherals and
unit record equipment

CROSS COMPUTER CORPORATION

360/370 & SYSTEM 3
FINANCING AVAILABLE
PHILADELPHIA (215) 568-6620
NEW YORK (516) 487-9812
505 Northern Blvd.
Great Neck, N.Y. 11021

Before you Buy -Lease -Sell- 360-370-1401-

All Type IBM
Unit Record Equipment
Please Call or Write
COMPUTER CLEARING CORP.
2600 Arroyo, Suite 124
Dallas, Texas 75219
Telephone (214) 528-5087
"We guarantee delivery at a fair market price."
—George Jachimiec, President—

TELEX 5848

Off-Line Printer System
Used only 3 months
For rent at $1300 per month
For sale at $48,000
Available immediately

SYSTEMS MARKETING, INC.
3930 E. Camelback road
Phoenix, Arizona 85018
(602) 956-8470
Contact Bob Russell

Current Inventory

SALE

All this Unit Record Equipment in stock and ready to ship at money saving sale or lease prices.

RARELY OFFERED 046, 029, 059, 407, A3, 548, 557, 087, 088
OTHER FINE MODELS. 024, 026, 056, 077, 085, 402, 403, 407, 514, 519, 523, 552, 602, 604, 521, 826

••• D.P. Equipment
••• Marketing Corp.
260 W. Broadway, N.Y. N.Y.
(212) 925-7737 Ext. 1

ACS

FOR SALE

1412 Sorter Reader
Avail — Dec

2415-1 Tape Drive
Avail — Now

082, 602, 552, 514
407-A2, 403-A1 w/Cad
083 w/Alpha & File Fd
COMPLETELY REFURBISHED ON M/C
AVAIL. IMMEDIATELY.

ACS Equipment Corporation
8928 Spring Branch Drive
Houston, Tx 77055
(713) 461-1333

NEED TO BUY

059-557-082-029-526

SALE OR LEASE

Reconditioned Machines
029-$1850; 026-$1450; 077-$1000; 082-$1300; 083-$2900; 085-$2000; 552-$1600; 402-$1200; 407-$2500

DATA RENTALS, INC.
2919 S. La Cienega Blvd.
Culver City, Calif. 90230
(213) 559-3822

360/30 Core

2701

For Sale or Lease
by owner
Immediately Avail.

(312) 297-3640
Mr. Fermanis

360-370 marketplace

BUY • SELL • LEASE

TLW COMPUTER INDUSTRIES INCORPORATED

BRANCH OFFICE:
222 E. Wisconsin Ave.
Lake Forest, Ill. 60045
(312) 295-2030

BRANCH OFFICE:
3031 Tisch Way
Executive Suite 13
San Jose, Calif. 95128
(408) 249-0110

3570 AMERICAN DRIVE • ATLANTA, GEORGIA 30341 • 404/451-1895

370/158

EARLY DELIVERY

SALE - LEASE

NEW - I.T.C. AVAIL.

CIS
CONTINENTAL INFORMATION SYSTEMS CORPORATION

Midtown Plaza
Syracuse, New York
(315) 474-5776
Telex 93-7435

FOR SALE

Equipment	Available
- 1440 8K System 3 Disks	Nov
- 1401 12K System 4 Tapes	Now
- 1419 with 360 Adapter	Jan
- CALCOMP 1 x 4 2314 Equivalents	Jan
- IBM 2312 Single Spindle Disk (can be added to 370 IFA)	Now
- 2314/2844 IBM Disk-System (2 Controllers with 9 Spindles)	Now
- 2501-B2	Now
- 360 & 370 CPU's & Components	

C.E.I. JUST "MOVED" FIRST 370/165 IN U.S.A.

WANTED: 370 CPU's * 370 Disk & Tape * 370 IBM Core Memory

8105 Edgewater Dr., Oakland, Ca., 94621
11 Grace Ave., Great Neck, N.Y. 11021

THE COMPUTER EXCHANGE INC.

CALL COLLECT: In East: (516) 466-6500, In West: (415) 638-9005

FOR SALE OR LEASE

360/30 COMPLETE SYSTEM

CORPORATE COMPUTERS, INC.
420 Lexington Avenue, New York, N.Y. 10017 (212) 532-1200

WANTED - PENSION PLAN SYSTEM

Established financial services company seeks title and marketing rights to a proven pension plan processing system. Principals only reply with details in confidence to

CW Box 3921
797 Washington Street
Newton, Mass. 02160

SYSTEM 360/370 | dearborn

computer leasing corporation

A business relationship you can't afford to be without . . .

- Lease Terms to Fit Your Needs
- Field Engineering Support
- Systems Engineering Support
- Well Trained Marketing Staff
- Buy and Sell-360s
- Subleasing
- Member, Computer Lessors Association

Dearborn Computer Leasing Corporation
a subsidiary of Dearborn-Storm
4849 North Scott Street / Schiller Park, Illinois 60176 Area 312 / 671-4410

BUY • SELL • LEASE IBM 360/370

IPS is the oldest dealer in used IBM equipment in the world. We have an experienced staff, hundreds of satisfied users, and a stable financial base. IPS carries a multi-million dollar inventory and is always prepared to buy or sell 360 or 370 equipment. On any 360 or 370 purchase, sale, or lease, call or write IPS for a realistic and competitive quote.

IPS

IPS COMPUTER MARKETING CORP.
467 Sylvan Avenue,
Englewood Cliffs,
New Jersey 07632
(201) 871-4200,
TWX (710) 991-9677

SALE OR LEASE

360 Systems
1401 Systems
2400 Tape Drives
2311 Disk Drives
1620 Systems
029, 206, 059
All Types Unit Record
Equip. Incl. 082, 083,
402, 407, 514, 519, 557

EQUIP. WANTED

360 Systems
1401 Systems
Tape Drives
All Types of
Card Equipment
029, 059, 026

SPECIAL SALE

360 (30) System
I.O. Set

1620 Disk System
1443 Printer
2311 Disk Drives

1401-8K
729-Tapes

- DPA with offices in most major cities now offers IBM equipment completely reconditioned prior to shipment.
- Member Computer Lessors Assn.
- Call or Write

dpa

D.P.A. INC., 2636 Farrington Street, Dallas, Texas 75107, (214) 637-0950

---

360 ★ BUY ★ SELL ★ TRADE ★ 370

★ LEASE/SUBLEASE ★

FOR SALE

360/30 64K 2 Channels
1403-N1 PRINTER & 2821-2
2501-B2 1000 CPM READER
2314-A1 6 SPINDLES
4-1600 BPI TAPES & CONTROLS
AVAILABLE NOW
OPTIONAL CONFIGURATIONS AVAILABLE

LUNCEFORD & ASSOCIATES
Valley View Bank Bldg.
Overland Park, Kan. 66212
(913) 381-7272

---

data sales co.

BUY • SELL • LEASE

IBM 360/370

SYSTEM 3 MEMORY

Call or Write
13200 Penn. Ave. So.
Burnsville, Minn. 55337
(612) 890-8838

CDC

CDC Peripherals
For Sale or Lease

6 Data Channels 3306
1 Card Punch 415 &
3446 Controller
3 Disk Drives 854 &
3234 Controller

141 Milk Street
Boston, Ma. 02109
(617) 482-4671

Computer Systems of America, Inc.

WE WILL PURCHASE THE FOLLOWING MACHINES:

024-026-029 Key Punches
082-083-084 Sorters
548-552-557 Interpreters
087-088-188 Collators
402 and 519

CONTACT VAN PERKINS
CIMARRON EQUIPMENT LEASING COMPANY
711 THURSTON NATIONAL BUILDING
TULSA, OKLAHOMA 74103
(918) 584-0073

IMMEDIATE INVENTORY DISPOSAL

GE Computer Components

Broker Inquiries Invited
Domestic and Foreign

FOR SALE

- Core Memory Stacks and Power Supplies
  Fabritek 256-14-05
  GE 43A143447
  20K words-74 bits
- Cables for GE 600 Series
- High Speed Paper Tape Reader
  43A1300S4P2
- GE Paper Tape Reader/Punch
  GE43A115257G2
- Capstens for Dual Capsten Tape Drives
  LH-E132181G1
  RH-E132180G1
- All Circuit Boards, Power Supplies, Memories, etc.
  GE CP2 and 4's
- GE 600 Series Circuit Boards
- Power Supply 43E140226G-1
- GE Cardliner 30 Reader
- Tradar Terminal

WRITE:

UNIVERSAL ROCKWELL DATA SYSTEMS
Suite 231, 655 Sky Way
San Carlos, Calif. 94070

BUY • SELL • RECONDITION TELETYPE®

Machines — New, Used

- Models 28, 32, 33, 35, 38
- BRPE's
- CRT's
- Couplers
- Enclosures
- Modems
- 10, 15, 30 CPS Terminals

NAT'L TELETYPEWRITER CORP.
23 Cain Dr., Plainview, N.Y. 11803
(516) 293-0444

LDI

SPECIALISTS IN
370 CORE
3360/003
3360/005

BUY • SELL
TRADE
• LEASE
ANY EDP
EQUIPMENT

Leasing Dynamics Inc.
3101 Euclid Ave.
Cleveland, Ohio
216-687-0100

FOR SALE

360/50

512 or 384 or 256K
2 Selector Channels
Available Immediately

cac COMPUTER ACQUISITIONS COMPANY

P.O. Box 80572, Atlanta, Ga. 30341 (404) 458-4425
Strathmore Office Building, Highway 34, Matawan, N.J. 07747
(201) 566-8924

Don't discount System/360.

Let us do it for you.

We lease 360/30's and 360/40's at low, low prices.
CPU's and complete systems.
Contact us today!

EDP Resources Inc.
One North Broadway
White Plains, N.Y. 10601

Call 914-428-3804

·LEASE · BUY · SELL·

370
LEASE PLANS
3 YEARS & LONGER
LOWEST RATES

360
PRE-OWNED
EQUIPMENT

THOMAS COMPUTER CORPORATION
625 N. Michigan Ave.
Chicago, Illinois (312) 944-1401

BUY·SELL·LEASE

360/20

360
30/40/50
65

370
145/155

1130

ECONOCOM

Division of Cook Industries, Inc.
2185 Democrat Road – P.O. Box 16902
Memphis, Tennessee 38116
901-396-8890 or 901-396-8600

WRIGHT LINE

Unitray Trucks for Tab Cards

- 60,000 Card Capacity
- 24 Trays Per Truck
- 53" H X 24" L X 19" W
- 2 Tiers Each Side – On Casters
- Excellent Condition

Cabinet and 24 Trays – $135.00
Trays Only – $4.00 Each

HARDY BRUSH CORP.
16 Haverhill Street
Andover, Massachusetts 01810
Call Collect: (617) 475-4000

MOVING?

Please notify *Computerworld* at least four weeks in advance. When writing about your subscription, please enclose a recent mailing label. The code line on top may not mean much to you, but it is the only way we have of quickly identifying your records. If you are receiving duplicate copies, please send both labels.

797 Washington Street
Newton, Massachusetts 02160

BUY SELL SWAP

ACS

HONEYWELL
1200 – 32K
4 – TAPE
2 – DISC
AVAILABLE NOW
PRICED TO MOVE!!
FOR SALE or LEASE
or LEASE/PURCHASE

ACS Equipment Corporation
8928 Spring Branch Drive
Houston, Tx 77055
(713) 461-1333

FOR SALE OR LEASE

IBM 1401
4K to 16K Systems
with or without
Tape Drives & Disks
Savings in thousands.

D.P. Equipment Marketing Corp.
260 W. Broadway, N.Y. N.Y.
CALL (212) 925-7737 Ext. 1

BUY SELL LEASE

1410 7074 729's
360/50, 512K, Late 73
Honeywell 200 System
Immediate
Systems and Components
Also Teletypes & CRT's

EBM
220 HARVEST AVE.
STATEN IS., N.Y. 10310
(212) 273-3636

MUST SELL OR LEASE

- IBM 1401 4K complete system
- IBM 1401 12K complete system
- IBM 1401 16K complete system
- IBM or Potter 729 (2), (5), (6) tape drives.
- IBM 360/20 C3 8K complete system

Thomas Computer Corp.
625 N. Michigan
Chicago, Ill
(312) 944-1401

For lease by owner 360/30 E or F

Available immediately with any features. I/O set and peripherals also available.

EDP RESOURCES INC.
One North Broadway
White Plains, N.Y. 10601
(914) 428-3804

Time for Sale

CONNECTICUT

COMPUTERISTICS
SUBSIDIARY OF
UNIROYAL
COMPUTER PROCESSING
SERVICES
360/65 • 1256K • OS
HASP RJE
360/50 360/40 360/30
BATCH PROCESS
Call Collect:

Cal Gould	(203) 573-3000
George Errico	(203) 573-2587

TIME FOR SALE

ILLINOIS

NEED TIME

360/65 DOS 512 K
with 7080 Emulator
12 Tape Drives
16 2314 Disk Drives
On and Off
Line Printers
Interested in Selling Block Time
Five or Seven Days a Week
Located in Chicago Central
Business District
Excellent Physical Facilities
Will Provide Office & Storage
Call (312) 225-6800, Mr. Zimmer

IBM 360/370 USERS

Computer Time Available

370/155 2.0 MEG, 8 3330's, 2 2314's, 10 3420 Tapes, RJE, BATCH, TSO

24 Hours—7Days

CAN YOU BEAT?
7.2 cents/sec for a 60K region?

360/65 1.5 MEG, 4 3330's
2 2314's
10 3420 Tapes

	8am—8pm	8pm—8am
Weekdays	Not Avail	$95/hr.
Weekends	$60/hr.	$50/hr.
12 hr. block weekend	$50/hr.	$40/hr.

370/135 144k, 1 2314, 4 2311, 6 3420-5 Tapes

	8am—8pm	8pm—8am
Weekdays	$85/hr.	$55/hr.
Weekends	$40/hr	$35/hr.
12 hr. block weekend	$35/hr.	$30/hr.

370/135 240K, 4 3330's, 1 2314, 6 2401-6 Tapes
Rates same as 370/135 above.

360/30 64K, 6 2401 Tapes, 5 2311's

	8am—8pm	8pm—8am
Weekdays	$45/hr.	$35/hr.
Weekends	$25/hr.	$25/hr.

FOR FURTHER INFORMATION CALL PAUL SARRIS or RON ELLIS (312) 346-1331

computer research company
200 N. Michigan Ave.
Chicago, Ill. 60601
Largest Computer
Time Sales Company

NEW JERSEY

POPULAR SERVICES, INC.

S/370 145-135-125
S/360 50- 40- 30

1287 OPTICAL SCANNER
2671 PAPER TAPE READER

ALL SHIFTS
(201) 471-2577

NEW YORK

Thomas National, Inc.
1775 Broadway, N.Y.C.

370/145
DATACENTER

OS-VS – HASP RJE
Turnkey Responsibilities
DOS Emulation
3330's and 2314's
Systems and Programming
Support
Data Entry Services
Convenient Midtown Location
Open 24 Hours Per Day
Call (212) 765-8500

Software for Sale

AUTOCODER & SPS TRANSLATED AUTOMATICALLY to BAL & PL/1

THE TOTALTRAN SYSTEM

. . . The most economical, practical and quickest method of converting to the 3rd and 4th generation.

3 SERVICES OFFERED:

1. 1400 Object to clean source decompilation
2. 1400 Clean source to BAL translation
3. 1400 Clean source to PL/1 translation

Contact: W. Small, President

CPU MANAGEMENT ADVISORY CORP.
853 Broadway, N.Y. 10003
(212) 777-7722

TAXBREAK

***

Payroll tax calculation module

***

Calculates payroll withholding taxes for 50 states, federal, FICA and cities. COBOL. $875 complete.

Maintenance service on tax changes available for $225 per year.

ARGONAUT INFORMATION SYSTEMS, INC.
Post Office Box 112
WALNUT CREEK, CA.
94596 (415) 937-4675

ACCOUNTING SYSTEMS

PAYROLL
GENERAL LEDGER
ACCOUNTS PAYABLE
INVENTORY
ACCOUNTS RECEIVABLE

IBM SYSTEM/3 USERS
IBM 360-70 USERS
RPG II BAL COBOL

Certified Software Products, Inc.
3050 Metro Drive
Minneapolis, Minn. 55420
(612) 854-3976

360/65

OS-MVT-HASP

We will give flat price contracts
on jobs regardless
of how much running time is involved

HF/II	APT	MPSX
ICES	BLISS	CROSSTABS
PICS	PAYROLL	SSP
MPS	PLAN	SAS
	BMD	

PROJECT II
ACCOUNTS PAYABLE
ACCOUNTS RECEIVABLE
GENERAL LEDGER
General Purpose Simulation System
Continuous System Modeling Program
Urban Transportation Planning System 360
Block Time and Remote Batch
Your Programs or Ours

Stat-Com
A Division of Statistical Tabulating Corp
(312) 346-7300
Vern Brownworth

SOFTWARE FOR SALE

CATS-A/P

ACCOUNTS PAYABLE
CASH REQUIREMENTS

Now in operation at:
*a large New York bank
*a Midwestern conglomerate
*a Massachusetts manufacturer
*a large Southeastem bank

Under control of the CATS MASTER Systems Controller, provided FREE with the license of any of the CATS programs. Also available are: Accounts Receivable — Open Item, Accounts Receivable — Retail System, and Inventory Recordkeeping.

For information contact:
Tom Leopard, President
COMPUTERWARES INTERNATIONAL
P.O. Box 31205, Birmingham
Ala. 35222 • Phone 205/592-6381

ACCOUNTING IV

THE FINEST GENERAL LEDGER AND FINANCIAL REPORTING SYSTEM AVAILABLE

Featuring:

- Conventional Report Generator
- Graphic Report Generator
- Matrix Report Generator
- Responsibility Reporting
- Flexible Budgeting Module
- Multiple Currency Version to accommodate foreign subsidiary accounting

informatics inc ®
65 Route 4
River Edge, N.J. 07661
New York (212) 564-1258
New Jersey (201) 488-2100

McCORMACK & DODGE CORPORATION

HAS
DEVELOPED
MARKETED
MAINTAINED

Accounting-oriented software products over the past five years.
Over 400 companies in the U.S. are using one or more of the following:

Fixed Asset Aanlysis &
Accounting System
Accounts Receivable
System
Investment Analysis
System

McCORMACK & DODGE CORPORATION
One Wells Avenue
Newton, Mass. 02159
(617) 965-3750

SOFTWARE FOR SALE

SYSTEM/3 TAPE USERS

NOW YOU CAN
DUMP TAPES
COPY TAPES
AND MORE!!!

Using our Tape Utility Program. (It works like ditto.)
For information contact:
Russell Fine
Micrographics, Inc.
640 N. LaSalle
Chicago, Ill. 60610
(312) 751-0350
The COMplete microfilm
service bureau

MMS GENERAL LEDGER

is hard at work for over 70 of the biggest US corporations* TO FIND OUT WHAT THEY KNOW THAT YOU DON'T, CALL:

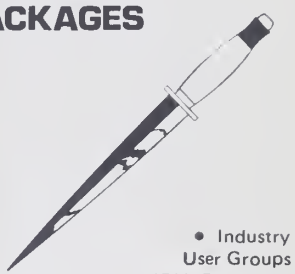
New York	212-972-9540
Chicago	(312) 729-7410
Atlanta	404-255-0039
Los Angeles	(213) 437-3301

Software
International
Corporation
2 Elm Square
Andover, Mass. 01810
(617) 475-5040

*so are Accounts Receivable, Accounts Payable, Inventory Management packages.

---

450 COMPANIES HAVE GAINED THE COMPETITIVE EDGE WITH MSA SOFTWARE PACKAGES



- Industry User Groups
- IBM, Burroughs RCA, Honeywell, ICL
- Warranted Performance
- Exceptional Documentation
- Continued Enhancements

USER ACCEPTANCE
BY PRODUCT

PAYROLL/PERSONNEL-175
GENERAL LEDGER-70
FIXED ASSETS-140
ACCOUNTS PAYABLE-50
INVENTORY CONTROL-15
(Announced 1/73)

Write or Call to Compare
William M. Graves
Management Science America
3445 Peachtree Road, N.E., Suite 1300
Atlanta, Ga. 30326

MSA

Atlanta	404–262-2376
New York	201–871-4700
Chicago	312–323-5940
Los Angeles	213–277-8411
San Francisco	415–328-1700

360 LEASE 370

IBM Computer Systems
& Unit Record Machines

BUY
SELL

LEASE PLANS
3 YEARS&LONGER
LOWEST RATES

you owe it to your company to
get the lower Datronic quote.

datronic

5210 Wesley Terrace
Chicago, Ill. 60656
Phone Area 312-922-0760

A 16 terminal IBM 2260 CRT system leases for about $2500 a month – from here to eternity.

If this same amount was used to lease/purchase a Wyle 8000 system, the buck passing would stop in less than two years!

How much can you save? This chart will give you an idea.

Number Of Terminals	Approximate Annual Saving After Payoff
16	$ 30,000
32	$ 60,000
64	$120,000
128	$240,000

Regardless of whether you buy or lease your Wyle system, you'll begin saving money from day one.

Wyle's 8000 is plug-to-plug & software compatible with IBM 360/370 systems. With more features for less dollars.

Such as 1920, 960 or 480 character screen capacity, up to 9600 bps data rate, non-destructive cursor, colon-seeking tab, special editing keys, character address, format protect, repeat key. Plus options including; columnar tab, lower case, function keys, numeric pad, hard copy printer and built-in data set.

So far, so good. A better product at a lower price. But what about experience? Financial responsibility? National sales & service?

Fact: Wyle has been building CRT terminals for reservations and ticketing since 1967, including a $2.5 million contract to supply 1150 terminals for New York City's off-track-betting system.

Fact: Our parent company, Wyle Laboratories, has annual sales of over $90 million and assets in excess of $60 million.

Fact: Nationwide sales is provided by GENESIS ONE, one of the country's largest and most experienced computer marketing organizations with offices in 40 major cities. Also nation wide service for full customer support.

So get the whole story of the Wyle 8000. Write for our brochure. Or better yet, phone the GENESIS ONE office nearest you.

GENESIS ONE
COMPUTER CORPORATION

WYLE COMPUTER PRODUCTS, INC.
A Subsidiary of Wyle Laboratories
128 Maryland St El Segundo CA 90245 (213)678-4251

HP Earnings Rise 38% in Nine Months

PALO ALTO, Calif. – The rise in earnings for the nine months at Hewlett-Packard outstripped the rate of revenue increase 38% to 34%, while in the third quarter earnings improved 14% on a 31% increase in sales.

Earnings for the nine months reached $33.8 million or $1.26 a share compared with $24.5 million or 93 cents a share during the same period last year.

Revenues reached $454.7 million compared with $339.5 million in the 1972 period.

Incoming orders for the period rose 41% to $530.2 million.

"International markets have been particularly strong, with orders from foreign customers amounting to $222.1 million for the nine-month period," Chairman David Packard observed.

"This represents a gain of 54% over the corresponding period of 1972. Domestic orders for the same period have risen 34% to $308.1 million," he said.

In the third quarter ended July 31, revenues reached $164.1 million, up from nearly $125 million for the same 1972 period.

Earnings totaled $10.6 million or 39 cents a share compared with $9.3 million or 35 cents a share in the year-ago period.

Third quarter earnings include a gain of about 2 cents a share realized from translating certain assets and liabilities held outside the U.S. into dollars, Packard said.

HP provided for about $1 million of income taxes on third quarter earnings generated abroad because of the uncertainty as to the outcome of tax proposals currently before the Congress, he said.

Incoming orders for the quarter totaled $198.7 million, a 45% increase over orders of $137.3 million in the same 1972 period.

The backlog has grown, Packard said, because of parts shortages in critical areas, causing production difficulties. As a result, shipments during the third quarter were substantially below the incoming order rate, he observed.

"These shortages may continue into the fourth quarter, but we expect we will be able to bring shipments more in line with orders by the end of the fiscal year," he said.

Drop in Leasing Sales Cited

Telex Loses $4 Million

TULSA, Okla. – Hot on the heels of the release of its 1972 results, which showed a $13.4 million loss [CW, Aug. 29], Telex Corp. has indicated it lost $4 million or 38 cents a share in the first quarter ended June 30.

This compares with earnings of $711,000 or 7 cents a share in the same 1972 period.

A Telex spokesman attributed the loss to "very few" sales to leasing companies.

'Substantial a Year Ago'

In the year-ago period, such sales were "substantial," he remarked.

The lack of sales is across the product line, he said.

Telex is currently moving to expand its own leasing base, he added.

Revenues rose to $19.8 million from $19.5 million in the year-ago period.

The sales value of peripheral equipment placed in service for the period totaled $21.1 million, up 16% over the $18.2 million a year ago.

Lease rental income totaled $5.3 million compared with $2.5 million in the year-ago period.

Firm orders for sale or lease of equipment had a sales value of $33.6 million compared with $43 million in the year-ago period.

Better Results Seen for EM&M

LOS ANGELES – With Electronic Memories & Magnetics Corp. showing sales increases of 56% and 52% in the quarter and six months compared with the 1972 periods, President Trude C. Taylor is looking for an even better second half in terms of both earnings and revenues.

Backlog Up

As of June 30, the firm's backlog stood at $53 million, up from $46 million Dec. 30, 1972, and $35 million a year ago, he said. New orders for the second quarter were at an annualized rate of about $118 million, he noted.

In the quarter, earnings reached $1.5 million or 27 cents a share compared with a restated $931,000 or 17 cents a share in the year-ago period.

Revenues jumped to $26.9 million from $17.3 million.

The six-month earnings totaled $2.9 million or 54 cents a share, up from $33,000 or 14 cents a share in the same 1972 period.

Revenues rose to $51.6 million from $33.9 million in the year-ago period.

FOR SALE OR LEASE
BY OWNER

- S/370 168 and 158's New – with ITC and warranty. October and November deliveries.
- S/370-155's with or without DAT. 1 megabyte. 3-year walkaway leases.
- 3360 Model 3's – in 30 days
- 3345 Model 2 and 3046

Call or Write:

Commonwealth Computer Advisers, Inc.
106 N. Eighth Street
Richmond, Virginia 23219
(804) 643-9123

STORE MORE. PAY LESS.

IBM 3360's
More storage for your 370/155 or 370/165 at much less cost. Lease 1 to 5 years or purchase. Delivery guaranteed to meet your specific needs.

alanthus
Alanthus Corporation
77 Tarrytown Road
White Plains, New York 10607

For further information,
call (914) 428-3703 or write:
Name ____________
Title ____________
Company ____________
Address ____________
City ____________
State ____________ Zip ____________
Phone No. ____________

FOR LEASE

IBM 370/155 CORE

1 MEGABYTE

55% OF IBM/MAC

CALL MIKE DEIXLER (212) 466-0666
OR WRITE THE GENERATION GROUP INC.
1089 SECOND AVENUE NYC NY 10022

Earnings Reports

ELECTRONIC ASSOCIATES
Three Months Ended June 29

	1973	a1972
Shr Ernd	$.12	$.09
Revenue	13,122,000	9,789,000
bSpec Cred	135,000	83,000
Earnings	326,000	239,000
6 Mo Shr	.38	.16
Revenue	21,997,000	18,787,000
bSpec Cred	730,000	177,000
Earnings	1,023,000	418,000

a-Restated to reflect pooling-of-interests merger with Infonics Inc. b-In 1973, includes tax credit plus gain on currency realignments; in 1972, consists of tax credit, loss on currency realignments and gain on sale of land and building.

GRANITE MANAGEMENT SERVICES
Year Ended Feb. 28

	1973	1972
Shr Ernd	.....	$.66
Revenue	$31,186,000	a29,697,000
Tax Cred	1,267,000	.....
Earnings	b(15,982,000)	1,846,000

a-Restated. b-Reflects a book-value adjustment on its portfolio of IBM System 360 computer equipment and other reserves and after a tax credit.

COMPUTER DATA SYSTEMS
Year Ended June 30

	1973	1972
Shr Ernd	$.46	$.18
Revenue	2,395,000	1,381,000
Tax Cred	106,500	39,500
Earnings	240,900	95,800

STERLING ELECTRONICS
Three Months Ended June 30

	1973	a1972
Shr Ernd	$.06	$.04
Revenue	15,010,083	14,364,271
Disc Op	(8,647)	9,011
Tax Cred	114,423	63,644
Earnings	229,583	137,026

a-Restated to reflect discontinued operations.

LEASCO
Three Months Ended June 30

	1973	1972
Shr Ernd	$.76	$.73
Revenue	183,260,000	162,820,000
Earnings	11,897,000	11,862,000
6 Mo Shr	1.48	1.26
Revenue	354,070,000	315,609,000
Earnings	23,563,000	20,466,000

GENERAL INSTRUMENT
Three Months Ended May 27

	1973	a1972
Shr Ernd	$.36	b$.20
Revenue	96,371,753	71,272,482
Earnings	2,836,334	1,782,742

a-Restated to reflect acquisitions on a pooling-of-interests basis. b-Adjusted to reflect a 2% stock dividend paid in May 1973.

MOHAWK DATA SCIENCES
Year Ended April 30

	a1973	a1972
Revenue	$143,216,000	$119,795,000
Spec Chg	122,000	295,000
Loss	431,000	765,000

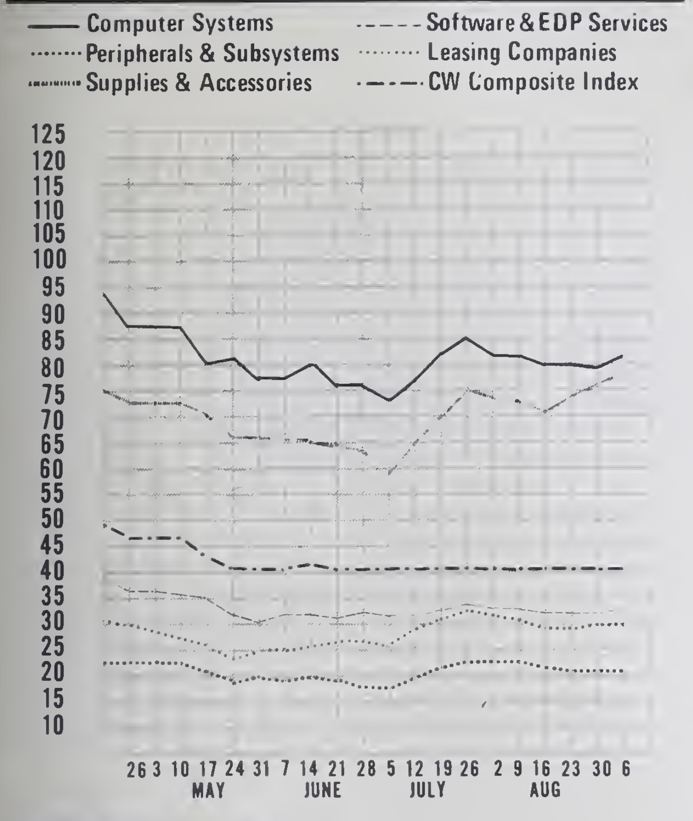
a-Includes results of operations, from the dates of acquisition, of Colorado Instruments, Inc., Data Systems Division of Marshall Industries, Elastolabs Corp. and Computing Efficiency, Inc.

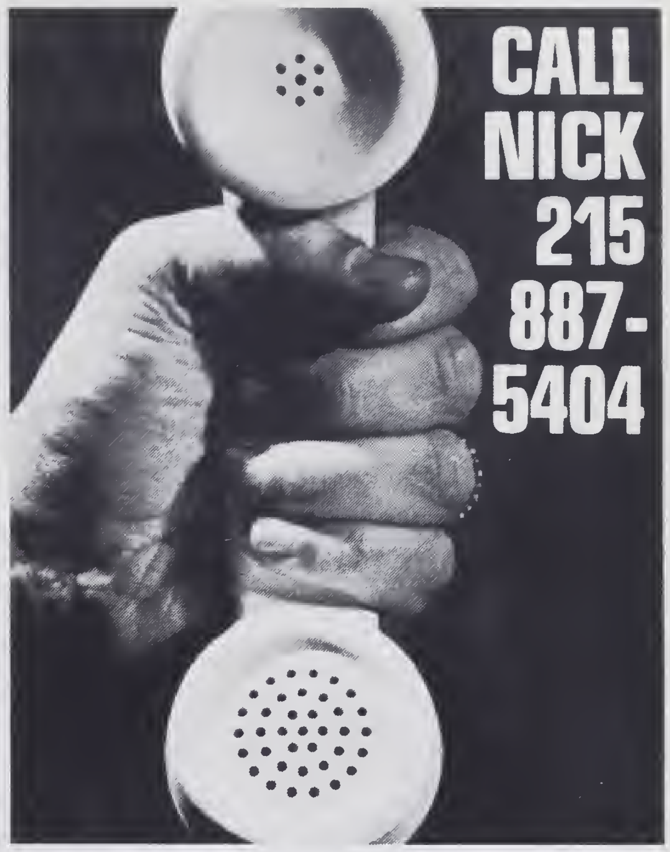
NASHUA
Three Months Ended June 29

	1973	a1972
Shr Ernd	$.71	$.59
Revenue	56,247,000	43,100,000
Earnings	3,229,000	2,637,000
6 Mo Shr	1.27	1.02
Revenue	104,362,000	82,511,000
Earnings	5,769,000	4,589,000

a-Restated for acquisition on a pooling-of-interests basis.

COMPUTERWORLD Computer Stocks Trading Indexes





Nick Cicchitti: If you need it — He's got it!

INVENTORY SALE

Qty.	Model/ Features	Description	Availability
1	2030F 3237, 4456, 4463 4468, 4760, 5856 6960, 6961, 7520	64K CPU (1.5 mic.)	Immediate
5	2311 1	Disc Storage Dr.	Immediate
2	2841 1	Storage Control	Immediate
1	1416 AN2	Print Train	Immediate

ALSO AVAILABLE

Qty.	Model/ Features	Description	Availability
1	370/155 J	CPU	October 1
2	3360 3	Core	October 1

ALL EQUIPMENT UNDER IBM MAINTENANCE

NVC COMPUTER SALES, INC.
Suite 616, Benjamin Fox Pavilion
Jenkintown, Pa. 19046 • (215) 887-5404

Computerworld Stock Trading Summary

TRADE*QUOTES

All statistics compiled, computed and formatted by TRADE★QUOTES, INC. Cambridge, Mass. 02139

COMPUTER SYSTEMS

EXCH		PRICE 1973 RANGE (1)	PRICE CLOSE SEPT 6 1973	WEEK NET CHNGE	WEEK PCT CHNGE
N	BURROUGHS CORP	211-245	223 5/8	-5 1/2	-2.4
N	COLLINS RADIO	16- 26	25 1/4	+ 1/8	+0.4
O	COMPUTER AUTOMATION	5- 16	13 1/4	+1 1/4	+10.4
N	CONTROL DATA CORP	31- 62	37 1/4	+3 1/2	+10.3
O	DATA GENERAL CORP	28- 46	44 1/4	- 3/4	-1.6
O	DATAPOINT CORP	10- 21	12 5/8	+2 7/8	+29.4
O	DIGITAL COMP CONTROL	2- 6	2 5/8	- 3/8	-12.5
N	DIGITAL EQUIPMENT	73-105	90 1/8	+1 5/8	+1.8
N	ELECTRONIC ASSOC.	4- 9	4 1/2	0	0.0
A	ELECTRONIC ENGINEER.	6- 11	9 5/8	+ 1/8	+1.3
N	FOXBORO	23- 37	36 7/8	+ 1/8	+0.3
O	GENERAL AUTOMATION	22- 55	38	+2	+5.5
O	GRI COMPUTER CORP	1- 3	1 1/4	- 1/8	-9.0
N	HEWLETT-PACKARD CO	73- 95	76 3/4	-4 3/8	-5.3
N	HONEYWELL INC	98-139	112	+3 1/4	+2.9
N	IBM	297-340	298 1/4	-5	-1.6
O	INTERDATA INC	7- 13	10 1/8	+2 1/4	+28.5
N	MEMOREX	2- 19	4 7/8	0	0.0
O	MICRODATA CORP	2- 10	2 3/8	- 1/8	-5.0
N	NCR	27- 38	35 3/8	+ 5/8	+1.7
N	RAYTHEON CO	22- 34	24 3/4	0	0.0
N	SINGER CO	45- 74	50 1/8	-1 1/8	-2.1
N	SPERRY RAND	36- 52	51 1/2	+2 1/4	+4.5
A	SYSTEMS ENG. LABS	3- 8	3	0	0.0
N	TEXAS INSTRUMENTS	83-111	110 1/2	+4 3/4	+4.4
O	ULTIMACC SYSTEMS INC	1- 11	2 5/8	- 3/8	-12.5
N	VARIAN ASSOCIATES	10- 20	14 3/8	+ 5/8	+4.5
N	WANG LABS.	13- 34	20 3/4	+ 1/8	+0.6
N	XEROX CORP	141-169	150	-4 1/8	-2.6

LEASING COMPANIES

EXCH		PRICE 1973 RANGE (1)	PRICE CLOSE SEPT 6 1973	WEEK NET CHNGE	WEEK PCT CHNGE
A	BOOTHE COMPUTER	1- 5	1 1/8	0	0.0
O	BRESNAHAN COMP.	1- 2	2 1/8	0	0.0
O	COMDISCO INC	6- 17	6 1/8	+ 3/8	+6.5
O	COMMERCE GROUP CORP	3- 4	3 3/4	+ 1/8	+3.4
O	COMPUTER EXCHANGE	1- 1	1/4	0	0.0
A	COMPUTER INVSTRS GRP	2- 8	2 1/2	0	0.0
O	COMP. INSTALLATIONS	1- 2	1	0	0.0
M	DATRONIC RENTAL	2- 3	2 1/4	0	0.0
A	DCL INC	1- 3	1 1/8	0	0.0
A	DEARBORN-STORM	12- 26	16 3/4	+1 7/8	+12.6
N	DPF INC	5- 9	4 3/4	0	0.0
O	EDP RESOURCES	1- 3	1 1/2	0	0.0
A	GRANITE MGT	2- 6	2 7/8	+ 1/8	+4.5
A	GREYHOUND COMPUTER	3- 6	3 7/8	+ 1/8	+3.3
A	ITEL	4- 12	4 3/4	- 1/8	-2.5
N	LEASCO CORP	8- 18	11 3/8	+ 3/8	+3.4
O	LEASPAC CORP	2- 8	1 3/4	- 1/4	-12.5
O	LECTRO MGT INC	1- 2	3/4	- 1/2	-40.0
O	NRG INC	5- 15	4 3/4	- 1/8	-2.5
A	PIONEER TEX CORP	5- 8	4 3/4	+ 1/8	+2.7
A	ROCKWOOD COMPUTER	1- 3	1 1/8	0	0.0
N	U.S. LEASING	16- 36	22 7/8	+1 3/8	+6.3

EXCH: N=NEW YORK; A=AMERICAN; P=PHIL-BALT-WASH
L=NATIONAL; M=MIDWEST; O=OVER-THE-COUNTER
O-T-C PRICES ARE BID PRICES AS OF 3 P.M. OR LAST BID
(1) TO NEAREST DOLLAR

SOFTWARE & EDP SERVICES

EXCH		PRICE 1973 RANGE (1)	PRICE CLOSE SEPT 6 1973	WEEK NET CHNGE	WEEK PCT CHNGE
O	ADVANCED COMP TECH	1- 2	1 1/2	+ 1/8	+9.0
A	APPLIED DATA RES.	2- 4	2 1/8	+ 1/8	+6.2
O	APPLIED LOGIC	1- 3	7/8	0	0.0
N	AUTOMATIC DATA PROC	39- 94	62 1/8	+3 5/8	+6.1
O	BRANDON APPLIED SYST	1- 1	1/4	0	0.0
O	CENTRAL DATA SYSTEMS	6- 9	6 1/4	0	0.0
O	COMPUTER DIMENSIONS	2- 5	2 1/4	0	0.0
O	COMPUTER DYNAMICS	1- 2	3/8	0	0.0
O	COMPUTER HORIZONS	1- 6	2 3/4	0	0.0
O	COMPUTER NETWORK	1- 5	1	0	0.0
N	COMPUTER SCIENCES	2- 6	2 7/8	0	0.0
O	COMPUTER TASK GROUP	1- 2	1 1/2	0	0.0
O	COMPUTER TECHNOLOGY	1- 3	1	0	0.0
O	COMPUTER USAGE	4- 9	5 1/2	- 1/8	-2.2
O	COMPRESS	1- 2	3/8	0	0.0
O	COMSHARE	4- 9	4 1/4	- 1/4	-5.5
N	CORDURA CORP	4- 15	3 7/8	- 1/8	-3.1
O	CYBERMATICS INC	1- 3	1 1/2	+ 1/8	+9.0
O	DATATAB	1- 4	1 1/2	+ 1/8	+9.0
A	ELECT COMP PROG	1- 2	1	- 1/8	-11.1
N	ELECTRONIC DATA SYS.	29- 56	38 1/2	+4 1/8	+12.0
O	INFONATIONAL INC	1- 2	1/2	0	0.0
O	INFORMATICS	2- 6	4 1/2	+ 1/8	+2.8
O	I.O.A. DATA CORP	1- 1	5/8	0	0.0
O	IPS COMPUTER MARKET.	1- 5	1 1/4	+ 1/8	+11.1
O	KEANE ASSOCIATES	3- 4	3 1/4	0	0.0
O	KEYDATA CORP	6- 12	6	0	0.0
O	LOGICON	3- 7	3 3/4	- 5/8	-14.2
A	MANAGEMENT DATA	2- 5	1 3/4	0	0.0
O	NATIONAL CSS INC	18- 42	26	+1 1/2	+6.1
O	NATIONAL COMPUTER CO	1- 1	3/8	0	0.0
O	NATIONAL INFO SRVCS	1- 2	1/2	0	0.0
P	ON LINE SYSTEMS INC	12- 18	18 3/4	+ 3/4	+4.1
N	PLANNING RESEARCH	2- 7	2 7/8	+ 1/8	+4.5
O	PROGRAMMING METHODS	21- 25	21	0	0.0
O	PROGRAMMING & SYS	1- 1	7/8	0	0.0
O	RAPIDATA INC	5- 24	5 5/8	- 5/8	-10.0
O	SCIENTIFIC COMPUTERS	1- 3	3/4	+ 1/8	+20.0
O	SIMPLICITY COMPUTER	1- 4	1 3/8	0	0.0
O	THS COMPUTER CENTERS	2- 4	1 3/4	0	0.0
O	TCC INC	1- 1	1/4	0	0.0
O	TYMSHARE INC	6- 12	9 3/8	+ 3/8	+4.1
O	UNITED DATA CENTER	4- 6	3 3/4	+ 1/4	+7.1
A	URS SYSTEMS	4- 8	3 7/8	+ 1/4	+6.8
N	WYLY CORP	4- 11	4 1/4	- 3/8	-8.1

PERIPHERALS & SUBSYSTEMS

EXCH		PRICE 1973 RANGE (1)	PRICE CLOSE SEPT 6 1973	WEEK NET CHNGE	WEEK PCT CHNGE
N	ADDRESSOGRAPH-MULT	12- 34	13 1/4	+ 1/4	+1.9
O	ADVANCED MEMORY SYS	5- 23	5 1/2	- 1/4	-4.3
N	AMPEX CORP	4- 7	4 5/8	- 1/8	-2.6
O	ANDERSON JACOBSON	3- 6	3 3/4	+ 1/4	+7.1
O	BEEHIVE MEDICAL ELEC	5- 10	5 1/2	0	0.0
A	BOLT.BERANEK & NEW	6- 12	6	0	0.0
N	BUNKER-RAMO	6- 18	9 3/8	- 1/8	-1.3
A	CALCOMP	5- 13	8 1/2	- 1/8	-1.4
O	CAMBRIDGE MEMORIES	8- 15	15 1/8	+1 3/8	+10.0
O	CENTRONICS DATA COMP	13- 32	28 3/4	+1 3/4	+6.4
O	CODEX CORP	9- 19	11	+ 1/2	+4.7
O	COGNITRONICS	1- 3	1 5/8	- 1/8	-7.1
O	COMPUTER COMMUN.	1- 4	7/8	- 1/8	-12.5
A	COMPUTER EQUIPMENT	2- 3	1 7/8	0	0.0
O	COMPUTER MACHINERY	5- 13	6 3/4	+ 3/4	+12.5
O	COMPUTER TRANSCEIVER	1- 6	2 1/8	+ 1/8	+6.2
N	CONRAC CORP	15- 32	15 3/4	+ 1/8	+0.7
O	DATA ACCESS SYSTEMS	1- 3	2	0	0.0
O	DATA 100	9- 18	12 1/2	+ 3/4	+6.3
A	DATA PRODUCTS CORP	2- 4	3 1/2	- 1/4	-6.6
O	DATA RECOGNITION	2- 3	1 1/2	0	0.0
O	DATA TECHNOLOGY	2- 5	2 3/8	- 1/8	-5.0
O	DECISION DATA COMPUT	8- 40	15 1/8	+2	+15.2
O	DELTA DATA SYSTEMS	1- 1	3/8	0	0.0
O	DI/AN CONTROLS	1- 4	1 1/2	0	0.0
N	ELECTRONIC M & M	3- 6	3 7/8	+ 1/4	+6.8
O	FABRI-TEK	2- 5	2 3/4	+ 3/8	+15.7
O	GENERAL COMPUTER SYS	5- 9	7 1/2	+1 1/2	+25.0
N	GENERAL ELECTRIC	56- 76	58 3/8	+ 1/8	+0.2
N	HAZELTINE CORP	5- 9	6	+ 3/4	+14.2
O	INFOREX INC	5- 23	7	+1 1/8	+19.1
O	INFORMATION DISPLAYS	1- 2	1/4	0	0.0
O	INFORMATION INTL INC	10- 15	10 1/2	+ 1/4	+2.4
A	LUNDY ELECTRONICS	3- 9	4 7/8	+ 1/4	+5.4
O	MANAGEMENT ASSIST	1- 1	1/4	0	0.0
A	MILGO ELECTRONICS	14- 28	15 3/4	-1 1/2	-8.6
N	MOHAWK DATA SCI	4- 13	5 1/8	+ 3/8	+7.8
O	ODEC COMPUTER SYST.	2- 6	2	0	0.0
O	OPTICAL SCANNING	2- 7	5 1/4	0	0.0
O	PERTEC CORP	5- 8	4 7/8	- 1/8	-2.5
O	PHOTON	3- 7	3 3/4	0	0.0
A	POTTER INSTRUMENT	3- 9	3 7/8	- 1/8	-3.1
O	PRECISION INST.	2- 6	3 1/2	+ 1/2	+16.6
O	QUANTOR CORP	5- 10	6 1/4	0	0.0
O	RECOGNITION EQUIP	4- 8	5	- 1/8	-2.4
N	SANDERS ASSOCIATES	7- 18	8 7/8	- 1/2	-5.3
O	SCAN DATA	1- 6	1 7/8	0	0.0
O	STORAGE TECHNOLOGY	11- 34	15	+ 1/4	+1.6
O	SYCOR INC	9- 14	12 1/4	0	0.0
O	TALLY CORP.	2- 14	3 7/8	+ 1/4	+6.8
O	TEC INC	6- 9	6 1/2	+ 1/2	+8.3
N	TEKTRONIX INC	30- 53	43 7/8	+4 1/8	+10.3
N	TELEX	3- 6	3	0	0.0
O	WANGCO INC	7- 13	9	- 3/8	-4.0
O	WILTEK INC	8- 18	10	- 1/2	-4.7

SUPPLIES & ACCESSORIES

EXCH		PRICE 1973 RANGE (1)	PRICE CLOSE SEPT 6 1973	WEEK NET CHNGE	WEEK PCT CHNGE
O	BALTIMORE BUS FORMS	5- 9	5 1/4	+ 1/4	+5.0
A	BARRY WRIGHT	6- 13	7	0	0.0
A	DATA DOCUMENTS	17- 22	20 3/8	+ 7/8	+4.4
O	DUPLEX PRODUCTS INC	7- 10	8 3/8	0	0.0
N	ENNIS BUS. FORMS	5- 8	5 5/8	+ 1/8	+2.2
O	GRAHAM MAGNETICS	9- 20	11 1/4	+ 3/4	+7.1
O	GRAPHIC CONTROLS	8- 12	10 3/8	+ 3/8	+3.7
N	3M COMPANY	78- 89	82	-3	-3.5
O	MOORE CORP LTD	53- 60	53 1/2	+ 3/4	+1.4
N	NASHUA CORP	42- 58	49 3/4	+1 1/4	+2.5
O	REYNOLDS & REYNOLD	40- 51	43 3/8	+1	+2.3
O	STANDARD REGISTER	14- 20	15 1/2	+ 1/2	+3.3
O	TAB PRODUCTS CO	8- 23	10	+1	+11.1
N	UARCO	15- 23	16 1/4	+ 1/4	+1.5
A	WABASH MAGNETICS	5- 7	6	- 1/8	-2.0
N	WALLACE BUS FORMS	15- 26	19 3/4	+1 5/8	+8.9

ITEL INTRODUCES THE TIE THAT DOESN'T BIND.

Our new short-term IBM 370 System lease.

It's a 2 or 3 year Packaged Operating Lease. For the company that values flexibility, but doesn't want to pay a premium for it.

Here's how it works:

ITEL will lease you an IBM 370 Central Processing Unit, plus ITEL's 7330 Disk Subsystem and ITEL Memory. At up to 40% savings over IBM's rental on an equivalent system.

This way, you keep your freedom and conserve capital at the same time.

ITEL's short-term IBM 370 System lease plan is another innovation from the people who pioneered IBM 370 Financial Packaged Leases. The same people who have already arranged for the lease of $400 million of IBM computer equipment.

So, if your company's plans call for short-term use of the IBM 370, you'll save big by calling the Data Products Group at ITEL—the financial alternative to IBM.

ITEL CORPORATION
One Embarcadero Center, San Francisco, Calif. 94111
(415) 989-4220

Please send me more detailed information on your short-term IBM 370 leases.

Name Title

Company Phone

Address

City State Zip

C-912